AN EVALUATION OF THE ROLE OF FORENSIC SCIENCE IN CRIME SCENE RECONSTRUCTION

By

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STUDY PREFACE

In this research, the use of forensic science in the reconstruction of murder crime scenes in the form of forensic photography evaluated how forensic photography is limited to the latter and its functions in reconstructing murder crime scenes. Photography is a fundamental aspect of forensic science, and is used throughout the investigation processs. Forensic photography starts at the crime scene and is used to document the actual crime scene, in order to keep a permanent record of the crime scene. Forensic photography is therefore used to document crime scenes and is also used in the further investigation process to record identity parades, pointing outs, and, most importantly, crime scene reconstructions.

This research strives to provide information to the South African Police Service (SAPS) detectives on the importance of forensic photography in the criminal investigation process, and on the methods by which it can be used to reconstruct murder crime scenes.

ABSTRACT

In this research, the role of forensic science with the use of forensic photography in the crime scene reconstruction process was evaluated. The researcher identified how SAPS detectives and Crime Scene Technicians (CST'S) are currently conducting crime scene reconstructions by adopting forensic photography; furthermore, other methods in which forensic photography could be used to conduct crime scene reconstructions were explored. The researcher made use of an empirical design, as the information available on the research topic was limited. The empirical design, together with a qualitative research approach, allowed for real-life observations. The simple random sampling method was used to select 20:10 partcipants for this research as follows: Ten (10) detectives that investigate murder cases, and another ten (10) CST'S that conducted crime scene reconstructions in the Durban Policing Area (DPA). Data was obtained using qualitative data collection methods that included a literature study and interviews. The findings of this research provide that the value of forensic science, as well as the use of forensic photography in the crime scene reconstruction process, was established. Evidently, detectives and CST'S are not doing everything possible to reconstruct murder crime scenes. For recommendation, this research suggests that SAPS detectives and crime scene technicians (CST'S) adopt the fundamentals of forensic science when reconstructing murder crime scenes.

KEYWORDS

Crime scene; Crime scene investigations; Crime scene reconstruction; Criminal investigations; Forensic investigations; Forensic photography; Forensic science; Murder.

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DECLARATION

Student Number: 36957178

I, Sherwin Singh, declare that **AN EVALUATION OF THE ROLE OF FORENSIC SCIENCE IN CRIME SCENE RECONSTRUCTION** is my own work, and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references. It is submitted in fulfilment of the requirements for the degree of MAGISTER TECHNOLOGIAE in the subject FORENSIC INVESTIGATIONat the School of Criminal Justice, University of South Africa (UNISA). It has not been submitted before for any degree or examination at any other University.

11 June 2018

SIGNATURE **DATE**

(Sherwin Singh)

EDITORS CERTIFICATE

31 January 2018

I, Marlette van der Merwe, hereby certifiy that the text and list of references of the master's dissertation, "An evaluation of the role of forensic science in crime scene reconstruction", by Sherwin Singh, have been edited by me, according to the Harvard referencing method (2011) as used by the School of Criminal Justice: Department Police Practice, at the University of South Africa.

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LIST OF ABBREVIATIONS AND ACRONYMS

3D	Three Dimensional
AFIS	Automated Fingerprint Identification System
ATM	Automated Teller Machine
BCIP	Basic Crime Investigation Practise
BPDLP	Basic Police Development Learning Programme
CBD	Central Business District
CPA	Criminal Procedure Act
CR & CSM	Criminal Record and Crime Scene Management
CR & FSS	Criminal Record and Forensic Science Services
CRC	Criminal Record Centre
CST	Crime Scene Technician
CST'S	Crime Scene Technicians
DNA	Deoxyribonucleic Acid
DPA	Durban Policing Area
FSL	Forensic Science Laboratory
FSS	Forensic Science Services
KZN	Kwa-Zulu Natal
LCRC	Local Criminal Record Centre
NPA	National Prosecuting Authority
ROC	Resolving of Crime
SAPS	South African Police Service
TTM	Technology and Technical Management
UK	United Kingdom
UNISA	University Of South Africa
VISPOL	Visible Policing

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CHAPTER ONE
GENERAL ORIENTATION

1.1 INTRODUCTION

Gilbert (2004:594) defines a crime scene as a location or place at which a suspected crime occurred, while Inman and Rudin (2001:197) state that a crime scene allows for criminal investigation by identifying, collecting, analysing and presenting the evidence at a court trial. Recording and documenting the crime scene allows the court to have a true reflection of the crime scene in a small and manageable size. The recording and documenting of a crime scene takes place in various forms, such as the taking of crime scene photographs, a plan drawn according to scale (or a rough sketch and sketch plan), the taking ofnotes, and even video recordings of the crime scene – either in Three Dimension (3D) or using a hand-held video camera.

The researcher decided to conduct this research, as forensic fieldwork is becoming more advanced every day, and many countries are turning to science to solve their crimes. This is indicated by Van Rooyen (2004:7), who states that forensic investigation is the utilisation of science to investigate crime. Crime scene reconstruction is the forensic science discipline in which one gains "*explicit knowledge of the series of events that surround the commission of a crime using deductive and inductive reasoning, physical evidence, scientific methods, and their interrelationships*" (Chisum & Turvey, 2011:9-10). The focus of this study is therefore on evaluating the use of forensic photography during the reconstruction of the crime stage.

1.2 THE RESEARCH PROBLEM

Leedy and Ormrod (2005:47) state that the foundation of any research is based on the research problem. When conducting research, it is of the utmost importance that researchers continuously clarify what they are doing during the various stages of their research. Welman, Kruger and Mitchell (2005:14) refer to a research problem as some difficulty that the researcher experiences in the context of either a theoretical or practical situation, and to which they want to achieve a solution. Mouton (2001:48) mentions that the problem

statement should be a clear and unambiguous statement of the object of study and the research objectives. Leedy and Ormrod (2005:47) stress the point that it is important to state research problems clearly, concisely and completely, in order to ensure that the research problem sets out precisely what is meant to be said.

The National crime statistics released by the SAPS Analysis of the National Crime statistics for the 2012/2013 financial year reflected that murders in Kwa Zulu-Natal (KZN) were on the increase. With an 11.1% increase in the murder rate in KZN alone, it was recorded as the highest increase in murders compared to the other eight provinces in South Africa (SAPS Strategic Management, 2013:23). For the purposes of this research and as part of the pre-research investigation, twenty (20) murder case dockets from Durban Central SAPS were perused. The reason for choosing Durban Central SAPS was that the researcher works at Durban Central SAPS. Furthermore the researcher is a detective at Durban Central SAPS and investigates serious and violent crimes, which includes murder cases. The researcher therefore had access to the murder dockets. With verbal permission from the branch commander the researcher informally perused the twenty (20) murder case dockets, only to establish if forensic photography was used to document and reconstruct any of the murder scrime scenes.

The reason for choosing murder incidents as a case study is that murder case dockets contain photographs, sketches and exhibits taken from the crime scene that enables the SAPS detectives and crime scene technicians (CST'S) to reconstruct the crime scene. However, when a crime scene is not attended to by a crime scene technician (CST) from the Local Criminal Record Centre (LCRC), the deceased (victim) is removed from the scene and taken to the state mortuary without the scene being documented and photographed. As a result in some instances, not only is the victim not photographed but also the entire crime scene is not processed resulting in physical evidence not being properly collected and documented. Forensic photography allows for critical information, an overall view of the crime scene, and evidence, to be captured in the form of photographs. These photographs are used to assist detectives during their investigation of a crime, and to present a visual representation of the crime scene to the court. The Prosecutors, Defence Attorneys and Magistrates involved in the litigation process of the crime do not have the opportunity to be at the crime scene; therefore,

the photographs taken at the crime scene should be taken, in order for the court to reach a correct decision. This will allow the court to be presented with a visual presentation of the actual crime scene (Fisher, 2004:86).

As part of a pre-research investigation, SAPS detectives from the selected five (5) police stations, namely Durban Central SAPS, Umbilo SAPS, Berea SAPS, Point SAPS and Cato Manor SAPS in the DPA, as well as CST'S from Durban LCRC were interviewed. Pre-research informal discussions with the detectives and CST'S were conducted, to establish whether the photographs and evidence collected from the initial crime scene were reviewed in an attempt to reconstruct the events that led to the crime.

From the pre-research investigation, the researcher found that the only time a reconstruction of a crime occurs is when the initial crime scene was not attended to by a CST and the crime scene was not documented at all. In this case, the detective contacts the CST a week or two after the incident occurred, to conduct a reconstruction of the crime scene. In these instances, the crime scene is pointed out to the CST by a detective or witness who was present at the initial crime scene. The detective or witness indicates where (place and position) of the deceased (victim); the area is marked, photographs are taken; and this is referred to as a "crime scene reconstruction".

The researcher has noticed that CST'S take some photographs of the place and area in which the crime scene occurred, and refers to this as a crime scene reconstruction. This is being done at the request of the detective, and is only done when the initial crime scene was not photographed. However, a crime scene reconstruction should be conducted, utilising the disciplines of forensic science, in conjunction with photography, to reconstruct the events leading to the crime scene, irrespective of whether a preliminary investigation was conducted or not. Brown and Davenport (2012:7) state that forensic science begins at the crime scene – the place where an incident took place. Brown and Davenport (2012:7) go on futher to say that forensic science is a scientific method in which a series of logical steps are used to solve a crime. Gardner and Bevel (2009:1) explain that crime scene reconstruction involves "*evaluating the context of a scene and the physical evidence found there to identify what occurred and in what order it occurred*". The problem, therefore, is, firstly, that detectives

only request a “crime scene reconstruction” if the crime scene was not initially visited by the CST and a preliminary investigation of the crime scene was not conducted. Secondly, detectives and CST’S do not attempt to reconstruct crime scenes where a preliminary investigation was done. Thirdly, when the CST does conduct a reconstruction of the crime scene, they merely take a few photographs of the area where the incident occurred, and refer to this as a “crime scene reconstruction”.

1.3 DEMARCATION

The researcher limited the research in respect of forensic science, to focus on how to use photographs as part of forensic science to reconstruct murder crime scenes. The Division: Criminal Record and Forensic Science Services (CR & FSS) consists of different components, such as the Criminal Record Centre (CRC), Technology and Technical Management (TTM) and the Forensic Science Laboratory (FSL) (Omar, 2008:29). The researcher demarcated this study to concentrate solely on the functions of the Criminal Record Centre (CRC), namely the Local Criminal Record Centre (LCRC) and SAPS detectives, and not on any other contributions that may have been made by other components of the Division: CR & FSS.

1.4 THE RESEARCH PURPOSE

According to the *Concise Oxford Dictionary* (2007:948), 'purpose' was defined as "*the reason for which something is done or for which something exists*". Denscombe (2002:25) states that the purpose of the research must integrate the focus of the research, as this provides the researcher with criteria to evaluate the results and findings of the research. Denscombe (2002:27) further explains that the results of the research may change and improve the procedures applied by CST’S in the way in which they reconstruct murder crime scenes. Babbie (2010:92) states that the most useful purposes for conducting research will comprise three elements: exploration, description and explanation.

The purpose of this research is to explore how forensic photography is of value when reconstructing murder crime scenes using forensic methods and techniques. This research

further describes and explains how forensic photography is of value in the reconstruction of murder crime scenes. The findings of this research will be shared by presenting new methods for conducting crime scene reconstructions, in training courses held for CST'S and detectives in the SAPS. This will enhance their knowledge and skills on adequately utilising the information they obtained from crime scenes, in order to conduct a reconstruction of the crime.

Based on the guidelines by Denscombe (2002:27), the purposes of this research are the following:

- To evaluate existing methods according to which CST'S are currently conducting murder scene reconstructions.

- To determine the strengths and weaknesses, as well as the best methods and practices, in forensic science, to determine how crime scene reconstructions can be enhanced.

- To explore national and international literature on the topic, to find out how murder scene reconstructions are conducted in other parts of the world, compared to those in South Africa. The researcher's intention is to report the findings on international and national literature, as well as that of the working environment, to integrate new information into the current working practices in South Africa.

- To recommend possible solutions and training programmes, which, if applied in practice, will enhance the performance of individual skills in reconstructing murder crime scenes in South Africa and perhaps elsewhere.

1.5 RESEARCH AIM

Denscombe (2002:11) highlights the importance of five main aims of scientific research: to understand properties, to understand relationships, to produce theories, to predict outcomes, and for other researchers to confirm the findings. Denscombe (2002:20) further states that

research should never promise outcomes that cannot be delivered, but, rather, aim to steer the direction the research will take, and offer direction to the target the researcher desires to hit.
De Vos, Strydom, Fouché and Delport (2011:94) explain that the terms 'aim', 'goal', 'purpose' and 'objective' are often used by researchers interchangeably as synonyms for one another. These authors further explain that the aim, goal or purpose can be viewed as the desired result of something one plans to do or achieve, whereas the objective refers to the steps the researcher has to take, starting at a basic level, and within a time frame, in order to reach the desired result of what the researcher planned to do or achieve. For this research, the researcher refers to the *research aim* as the desired result that the researcher wishes to achieve. The aim of this research was to determine the value of photographs as a technique used in the forensic science discipline to reconstruct the crime scene and to assist the court during the litigation process to have a visual presentation of the crime scene to reach the correct decision.

1.6 RESEARCH QUESTIONS

In order to achieve the aim of this research, the key themes of the research are identified through the development of research questions that provided guidance to the researcher in managing and analysing data that emerged out of the research questions (Noaks & Wincup, 2004:122). Jesson, Matheson and Lacey (2011:18) explain that research questions provide a structure for the literature review of a research study, and suggest that defining the research questions is a crucial step that points the research investigation in the right direction. Further to this, Denscombe (2012:82) states that research questions show how the research will be put into practice, and should specify what factors and relationships must be investigated to provide data that will be useful in addressing the research aims.

In order to provide direction and structure to the study, the following research questions were formulated to be answered in this research:

- What is the role of forensic science (forensic photography) in criminal investigations?
- How can photography, as part of forensic science, be used in the reconstruction of murder crime scenes?

1.7 KEY THEORETICAL CONCEPTS

Leedy and Ormrod (2015:70) state that when compiling a research report, the researcher should know the literature related to their topic. Leedy and Ormrod (2015:71) further state that since literature is available in various places, such as books, newspapers, journals, government publications, conference presentations and Internet websites, a good way to start a literature search will be to focus on keywords. Key theoretical concepts come from conceptualisation. Mouton (1996:114) states that, in the first place, 'conceptualisation' means to define the key concepts in the problem statement. Leedy and Ormrod (2015:71) support the view of Mouton (1996:117) by stating that a prime source of keywords is in the statement of the research problem. Maxfield and Babbie (2005:120), supported by Berg (2007:36), emphasise the value of conceptualising as a term used to ensure that readers understand what is meant by certain concepts in the research. This enables readers to evaluate how effectively identified key concepts are applied in a study.

The key concepts outlined below are therefore defined for the purpose of this research:

1.7.1 Crime

Snyman (2008:4) describes crime as an "*unlawful, blameworthy conduct punishable by the state*".

1.7.2 Crime scene

The SAPS policy on crime scene management (SAPS, 2009a:2) refers to a crime scene as a place, including the surrounding areas of where an alleged offence was committed and where items with evidential value can be collected.

1.7.3 Crime scene reconstruction

Crime scene reconstruction involves evaluating the context of a scene, and the physical evidence found there, in an effort to identify what occurred and in what order it occurred (Gardner & Bevel, 2009:1).

1.7.4 Criminal investigation

Gilbert (2010:34) provides a definition of criminal investigation as a logical, objective legal inquiry involving possible criminal activity, while Hess, Orthmann and LaDue (2016:8) define criminal investigation as the process of discovering, collecting, analysing and presenting evidence in a court of law, to determine what happened and who is responsible.

1.7.5 Evidence

Holden (2006:39) points out that evidence is anything or any item,either seen or unseen to the naked eye, that has been used, left, removed, altered or contaminated, during the commission of an offence.

1.7.6 Forensic science

Forensic science is the application of scientific techniques and principles to provide evidence to legal or related investigations and determinations (Tilstone, Savage & Clark, 2006:1). White (2010:2) describes forensic science as any scientific and technical knowledge that is applied to the investigation and evaluation of evidence, to assist courts in resolving questions of facts in court.

1.7.7 Forensic photography

Forensic photography, sometimes referred to as forensic imaging, or crime scene photography, is the art of producing an accurate reproduction of acrime scene using photography, for the benefit of a court, or to aid in an investigation. It is part of the process of evidence collection. It provides detectives with photographs of victims, places and items involved in the crime (Miller & Massey, 2016:45).

1.7.8 Forensic Science Laboratory

The Forensic Science Laboratory undertakes to scientifically interpret all clues with physical evidence optimally, in order to deliver an impartial expert finding with opinions in criminal cases, thereby ensuring that justice is served (SAPS, 2006:9). The FSL comprises the biology, chemistry, scientific analysis, ballistics, questioned documents and explosives units (Omar, 2008:29).

1.7.9 Murder

Murder is the unlawful and intentional causing of death of another person (Joubert, 2010:101).

1.8 RESEARCH DESIGN AND METHODOLOGY

Kumar (2015:5) states that research is a way of obtaining answers to professional questions adhering to the conventional expectations of scientific procedures. Leedy and Ormrod (2010:10) add that research is a systematic process of collecting, analysing and interpreting information (data), in order to increase one's understanding of a phenomenon about which one is interested or concerned about. Pitts and Smith (2007:4) are of the opinion that research is about generating knowledge for a purpose. Leedy and Ormrod (2005:12) state that the methodology of a research project can be described as the approach that the researcher takes in carrying out their project. To some extent, this approach dictates the particular tools the researcher uses. Researchers must create knowledge in relation to a specific set of problems or challenges. Leedy and Ormrod (2005:94) further explain that different research problems lead to the use of different research designs and methods. This determines the manner of collecting different types of data, and, accordingly, different interpretations of the collected data.

Methodologies can either be qualitative or quantitative, or more specific – for example, grounded theory (Silverman, 2000:79). Creswell (2013:22) is of the opinion that the methodologies used by qualitative researchers are characterised as inductive, emerging, and shaped by the researchers' experience in collecting and analysing data. Qualitative researchers follow logic that is inductive "*from the ground up, rather than handed down from the theory or the perspectives of the inquirer*" (Creswell, 2013:22).

1.8.1 Research design

Leedy and Ormrod (2015:92) state that when one speaks about a general strategy to solve a research problem, one is in actual fact speaking about a research design: "*The research design provides the overall structure for the procedure the researcher follows, the data the researcher collects, and the data analysis the researcher conducts*". Simply put, the research

design involves planning. In this light, research methodology is employed to extract meaning from data, and, to some extent, the data to be collected will dictate the research method. Denscombe (2010:100) explains that a research design explains how the key components of the research project link together, and, further, explains the logic of the research process as it moves from the one phase to the next, showing how the data collection and analysis are consistent in terms of their general philosophy.

Babbie and Mouton (2004:197) state that a research design is a plan or structured framework of how the researcher intends conducting the research process in order to solve the problem. David and Sutton (2011:204) maintain that the purpose of the research design is to provide a framework for the collection and analysis of the data. Boeijie (2010:19) adds that a research design is composed of the research questions, research purpose, an ethical paragraph, an outline of the overall research strategy, and the specific methods, techniques and instruments to be used during the study. From the views of both David and Sutton (2011:204) and Boeijie (2010:19), it can be concluded that a research design provides the framework upon which the research is conducted, and enables the researcher to gather evidence that will allow the research questions to be addressed.

The researcher considered an empirical design to be the best for this study, as the initial investigation revealed a limited amount of information available on the research topic. An empirical study assisted in answering the aim and research questions by knowing and understanding the research problem through the literature review and conducted interviews. The empirical research design use fewer numbers of a sample, and apply structured questions (Mouton, 2001:55). Empirical research involved dividing the problem into sub-problems, and then collecting data on the sub-problems by means of events and observations (Leedy & Ormrod, 2013:5).

According to Denscombe (2002:27), the production of knowledge is based on experience. Bless, Higson-Smith and Sithole (2013:3) support the view of Denscombe (2002:27), as well as that of Leedy and Ormrod (2013:5), stating that the empirical method is where facts are observed in nature and are the foundation of knowledge. Bless, Higson-Smith and Sithole (2013:3) further state that observation is observed in nature, and what is observable, can

constitute knowledge. Denscombe (2002:6) suggests that empirical research "*involves the idea of getting of the chair, out of the office and purposely seeking necessary information"*. This means that the researcher had to go into the field to conduct fieldwork, and focus on the personal experiences of the participants in the study (Mouton, 2001:149). Denscombe (2002:6) is supported by Leedy and Ormrod (2015:20) in that empirical research is research that involves the collection and analysis of new data. In this research, the production of knowledge was important, as there was not much written on the topic under investigation.

Bless Higson-Smith and Sithole (2013:8) state that scientific research is scientific since the aim is to know and understand reality. Bless, Higson-Smith and Sithole (2013:8) state further that each step is based on observation, be it when collecting the basic facts, testing an explanation, assessing the value of a prediction, or as the result of an intervention; therefore, the researcher concludes that empirical research has a tendency to focus on the production of data based on real-world observations. The researcher therefore addressed the problem under investigation by exploring new ideas regarding the use of forensic science (forensic photography) in crime scene reconstruction.

1.8.2 Research approach

The research approach comprises the plan and procedures for research, which span the steps from broad assumptions to detailed methods of data collection, analysis and interpretation (Creswell, 2014:3). Supporting the empirical design and to help the researcher create new knowledge, the researcher needed an approach that was practical, in order to improve the situation. A qualitative phenomenological approach was used by the researcher when conducting this research. The goal of qualitative phenomenological research is to describe a "lived experience" of a phenomenon (Waters: 2017).

Roberts (2004:11) and Leedy and Ormrod (2005:133) affirm that qualitative research focuses on phenomena that occur in natural settings, which is the real world, and involves studying those phenomena by exploring, explaining, describing and evaluating. Creswell (2014:4) describes qualitative research as an approach applied to explore and understand the meaning provided by individuals to a social or human problem. Mouton (2001:161-162) maintains that qualitative evaluation approaches involve the use of predominantly qualitative research

methods to describe and evaluate the performance of programmes in their natural settings, focusing on the process of implementation rather than on quantifiable outcomes. The researcher considered the qualitative research approach, as fieldwork was adopted for data collection coupled with observations, schedules and conducted semi-strcutured one-on-one in-depth and open-ended interviews with the selected participants and perusal of written documents (Roberts, 2004:11). The researcher then explained, described and evaluated his finding of this research.

Maharaj (2013:3) states that qualitative research allows participants to tell their stories in their own words in a natural setting, allowing for a true reflection of what the participants said to be recorded. This also allowed the participants to say what they wanted to say, and not specifically what the researcher wanted to hear. The researcher concluded that interviewing SAPS detectives and CST'S currently in practice, and employed by the SAPS, led to obtaining a good understanding of the research problem.

1.9 STUDY POPULATION

Babbie and Mouton (2001:174) state that a population is that aggregation of elements from which the sample is actually selected. Strydom (2011:223) states that the term 'population' creates boundaries on the study units and refers to a certain group of individuals in the universe with specific characteristics. Bless and Higson-Smith (2000:85) describes a population as a group of people being the object of the research, and about which the researcher wants to determine some characteristics. Sekaran and Bougie (2009:262) clarify that a 'research population' refers to an entire group of people, events or things of interest, that the researcher wishes to investigate. The 'population' encompasses the entire collection of units from which the researcher wishes to form conclusions.

The ideal population for this research comprised all persons in South Africa involved in the crime scene reconstruction process, that is, all SAPS detectives investigating murders, all the CST'S conducting crime scene reconstructions, as well as FSL personnel who assist in blood spatter analysis, and so forth. In this study, however, the size of the population rendered it impractical and non cost effective to involve all the members of the population in the project,

as explained by Welman and Kruger (2002:46), as the ideal population was too large and too widely spread throughout South Africa.

The researcher lives and works in Durban, KZN. The researcher is currently employed as a SAPS detective. The researcher has eleven years' service in the SAPS, which includes seven years as a CST within the LCRC environment, and one year seven months as a SAPS detective, investigating murder and robbery cases at Durban Central SAPS. The researcher found that while working in the Durban LCRC, SAPS detectives from surrounding areas would request CST'S from Durban LCRC to conduct crime scene reconstructions of murder crime scenes that were not initially processed and documented due to various reasons. It was from here that the problem of under-utilising forensic science to conduct crime scene reconstructions emanated. It therefore made sense, financially and logistically, for the researcher to focus on SAPS detectives in the eThekwini Central Cluster and CST'S from Durban LCRC, to establish whether they understood the value of forensic photography and its use in reconstructing a murder crime scene. The researcher wished to establish under what circumstances SAPS detectives from the eThekwini Central cluster request a crime scene reconstruction to be carried out, and what methods and procedures are used by CST'S from Durban LCRC when conducting these crime scene reconstructions.

1.10 TARGET POPULATION

Welman, Kruger and Mitchell (2005:14) stated that the target population is the population to which the researcher would ideally wish to generalise their results. In this research, the target population was SAPS detectives from the eThekwini Central Cluster consisting of SAPS general detectives who investigate murders from seven (7) police stations in the DPA, namely: Durban Central SAPS, Berea SAPS, Sydenham SAPS, Point SAPS, Mayville SAPS, Cato Manor SAPS and Umbilo SAPS, as well as CST'S who photograph and reconstruct murder crime scenes from the Durban LCRC. The reason for choosing these police stations and Durban LCRC was based on the fact that this is the area in which the problem was identified. Further to this, the researcher lives in Durban, KZN, and has worked in the Durban Central policing area for eleven (11) years. It therefore proved to be cost effective.

1.11 SAMPLING TECHNIQUES AND PROCEDURES

The subset of the whole population, which is actually investigated by a researcher, is called a "sample" (Bless Higson-Smith & Sithole, 2013:162). Sampling is the process of taking a sample from a population (Christensen, Johnson & Turner, 2011:150). Fox and Bayat (2007:54) as well as Leedy and Ormrod (2010:196) are in agreement that sampling is the process by which elements are drawn from the population. The purpose of drawing the elements from the population is to obtain a sample. Kumar (2011:193) defines sampling as the process of selecting a few (a sample) from a bigger group (the sampling population) to become the basis for estimating or predicting the prevalence of an unknown piece of information, situation or outcome regarding the bigger group. Champion (2000:172) stated that sampling means taking the proportion of persons from the whole class of persons from or about which one seeks information. According to Welman and Kruger (2001:47), supported by Bless, Higson-Smith and Sithole (2013:166) as well as Leedy and Ormrod (2015:178-183), the different sampling techniques are probability samples – that is, simple random sampling, stratified random sampling, systemic sampling, cluster sampling, and non-probability sampling – which is composed of accidental or incidental sampling, purposive sampling, quota sampling and snowball sampling.

Random sampling, also known as probability sampling, determines the probability that any element or member of the population will be included in the sample (Welman & Kruger, 2001:48). Blaikie (2003:168), Fox and Bayat (2007: 55) and Suter (2012:472) state that a sample drawn from the population in such a way that each element of that population has the same chance of being drawn during the first draw and each successive draw, is known as a simple random sample. Simple random sampling is the definitive case of an equal probability of selection method, and ensures that each element will have an equal chance of selection, independent of any other event in the selection process.

In this study, the researcher used the simple random sampling method to select samples"A" and "B". Leedy and Ormrod (2015:179) state that, in simple random sampling, each member of the population must have the same and equal chance of being included in the sample, and that each sample must have an equal chance of being chosen. In this research, the sample was selected from the target population chosen by the researcher. All individuals from the

target population had the same chance of being selected and included in the sample, despite their rank, age, language or ethnic group.

1.11.1 The selection of South African Police Service detectives (Sample "A")

From the target population, of the total number of SAPS detectives available, a sample of ten (10) SAPS detectives with eight (8) or more years experience in investigating murders were selected to participate in this research. Each station had between five (5) and fifteen (15) SAPS detectives investigating murder cases. Using simple random sampling, ten (10) SAPS detectives were selected as target population of this research and form Sample "A". Leedy and Ormrod (2005:201) state that simple random sampling is easy when the population is small and all of its members are known. The researcher drew up a name list of all the SAPS detectives who investigated murder cases at their respective stations, together with their years of experience investigating murders. This information was obtained from the detectives' branch commanders from the seven (7) different police stations. A total of fifty (50) SAPS detectives from the seven (7) different police stations were actively involved in investigating murder cases. From these fifty (50) SAPS detectives, thirty (30) had eight (8) or more years' experience in investigating murders. Bless Higson-Smith and Sithole (2013:174) suggests that at least five percent (5%) of the population form one's sample. The researcher therefore used a third (33.3%) of his target population to create Sample "A", as he used ten (10) SAPS detectives from the thirty (30) that had eight (8) or more years' experience in investigating murders. The researcher then took the names of all thirty (30) SAPS detectives with more than eight (8) years' experience and wrote them on separate pieces of paper. The thirty (30) pieces of paper with the thirty (30) SAPS detectives names where then placed them in a hat. The pieces of paper containing the SAPS detectives' names were then mixed in a hat and the researcher randomly drew ten (10) names from that hat –which formed Sample "A".

1.11.2 The selection of crime scene technicians (Sample "B")

At the time of this research, there were sixty (60) operational CST'S conducting murder scene reconstructions in the Durban LCRC. All sixty (60) members were given an equal opportunity to be part of the research, as they were supposedly attending all murder crime scenes requested by the SAPS detectives. At the time of this research, Durban LCRC was working a flexi-shift system consisting of three (3) shifts, with twenty (20) members on each

shift. At any given time that one shift was performing crime scene duties, another could have been on rest days, and the third would be available in the office performing administrative duties. Taking leave and sick leave into consideration, there would be a minimum of ten (10) CST'S available at any given time. In selecting the sample of ten (10) CST'S, the sixty (60) names were written on separate pieces of paper and placed in a box. Using the simple random technique, the first ten (10) names selected were taken as Sample "B", to be interviewed. Arrangements were then made with the selected participants, as to a date and time to be interviewed at their offices.

For the purpose of this researcher, the researcher decided that the overall population of this research consisted on ten (10) SAPS detectives and ten (10) CST'S from Durban LCRC. The SAPS detectives investigated murders within the eThekwini Central Cluster and met the criteria of having eight (8) or more years experience in investigating murders and were currently still investigating murders at the time of this research. The CST'S were actively involved in processing and reconstructing murder scene in the DPA.

1.11.3 Representativeness

Representativeness has particular relevance in small-scale research (Blaxter, Hughes & Tight, 2008:221). It relates to whether the findings of the research are likely to have broader applicability, beyond the focus of the study. These authors further state that if the researcher has carried out a detailed study of a specific institution, group – or even individual, that researcher would be able to determine whether the findings were relevant beyond that specific institution, group or individual. To ensure that studies are representative, researchers need to draw appropriate samples – which may require considerable effort (Flick, 2011:181).

According to Flick (2011:181), one approach for evaluating qualitative research is to ask what measures have been taken to define or extend the area of validity of empirical results, and the generalisation of the results is often closely linked to the way the sample is done. A representative sample is a sample which reflects the population accurately, so that it is a microcosm of the population (Bryman, 2001:507). Gomm (2009:298) states that the object of the research is to recruit a sample of people who will be representative of the population from

which the sample was drawn, so that what is found to be true for the sample can be confidently generalised to the population. This is known as 'empirical representativeness'.

Samples are chosen by the researcher on the basis that they are representative of the population as a whole, meaning that the sample's main characteristics are similar or identical to those of the population. Gray (2004:84) stated that most methods used to achieve representative samples depend on the process of random sampling, because random sampling is the selecting of a sample such that each member of the population has an equal chance of being selected. Gray (2004:84) stated further that the chances of a sample being representative are higher through random selection, than if the sample was purposive. Leedy and Ormrod (2015:176) state that the participants in a research study must be representative of the population about which the researcher wishes to draw conclusions.

For the purposes of this study, the researcher decided to include all SAPS detectives that investigate murders from the eThekwini Central Cluster, in order to ensure representativeness of the SAPS detectives within that cluster, as this is where the problem was identified. The researcher also intentionally selected all the CST'S from Durban LCRC as a sample, because of their expertise in murder crime scene investigations and reconstructions. The researcher considered the SAPS detectives and CST'S to be representative of the population, as they met the criteria for inclusion, and was actively involved in the investigation and reconstruction of murder crime scenes within the DPA. The participants from Samples "A" and "B" were selected using simple random sampling.

1.12 DATA COLLECTION

Data collection is part of the qualitative approach that was selected for this research. Leedy and Ormrod (2005:96) state that qualitative research is often described as the research instrument, because most of the data collection is dependent on personal endorsements such as interviews and observation, and data can be considered to be "*reductions of experience*". When taking into consideration people's "*thoughts, behaviours, emotions, artefacts and environments*", and then representing this in the form of sounds, words or pictures, results in qualitative data (Bernard, 2013:394). Mouton (2001:98) supported by Bless Higson-Smith and Sithole

(2013:22) and Leedy and Ormrod (2015:99), state that observations, interviewing and documentary sources are frequently used data collection methods in qualitative research. The The Monash University Research Data Policy (2011) (as cited in Rice & Southhall, 2016:20) defines research data as:

> The data, files, records or any other evidence, irrespective of their content or form (e.g. in print, physical, digital or any other forms) that comprise research observations, findings or outcomes, including primary materials and analysed data.

The data collected for this research is both primary and secondary data. Blaikie (2003:18) classifies primary data as data that is collected, analysed and reported on by the researcher. Primary data results from direct contact between the researcher and the source of the data. Primary data is considered to be the most valid form of data, as it is the most truth manifesting (Leedy & Ormrod, 2001:95). In this study, the sources of primary data were one-on-one in-depth open-ended interviews conducted by the researcher with the participants, who comprised the general detectives from the seven (7) different police stations that fall under the eThekwini Central Cluster (Sample "A"), and also the CST'S from the Durban LCRC (Sample "B"). The study of the relevant literature by the researcher is classified as secondary data.

In triangulation, researchers make use of "*multiple and different sources, methods, directives and theories to provide corroborating evidence*" (Creswell, 2013:251). Triangulation involves a corroboration of evidence from different sources, in order to give insight into a theme or perspective. The researcher employed the triangulation process when collecting data for this research. According to Powell and Connaway (2004:124), triangulation involves using a variety of methods and techniques to collect data for a single study. Leedy and Ormrod (2015:104) are of the view that triangulation is when multiple sources of data are collected with the hope that they will all converge to answer a specific research question. Mason (1998:148) states that triangulation enhances the validity of research, in the sense that it suggests that social phenomena are a "*little more than one*", and that a study manages to grasp more than one of those dimensions.

The researcher made use of multiple sources, methods, information obtained from interviews with the participants in this study, and theories, to provide corroborating evidence. The collection of corroborating evidence from different sources allowed for light to be shed on a theme or perspective. This allowed data to be collected from different sources, triangulating the information and providing validity to the findings. From Leedy and Ormrod (2015:104), the feedback collected from the interviews conducted with the participants in this research, together with the documentary sources used throughout this research as well as real life observations made in the field on the topic under investigation, allowed for both the research questions asked in this study to be answered with corroborating evidence.

1.12.1 Literature

Creswell (2009:25) provides that the reason for conducting a literature review is to share the results of other studies that are similar or alike to the current study being undertaken. It also provides a framework to establish the importance of the study undertaken, as well as to provide a benchmark for comparing the results of the current study with other findings. The literature was used to contextualise the researcher's study, to explain and argue the data obtained, and to indicate the relevance of the findings in this research in relation to other existing bodies of literature (Henning, Van Rensburg & Smit, 2004:27). The literature collected for this study was used and incorporated throughout the discussion of this study, and was used to substantiate, compare and contrast the themes and results that emerged from the study (Creswell, 2009:27).

The following steps, as recommended by De Vos, Strydom, Fouché and Delport (2011:134) as well as Creswell (2009:29), were used when collecting literature in this study:

- The research topic established a foundation for the research, and determined what needed to be studied and analysed in order to find similar literature on the problem. The researcher began by identifying key concepts of the research, namely identification of crime, forensic science, crime scene reconstruction, criminal investigation and forensic investigation. This was done in an attempt to find similar literature on the topic and research questions in the research.

- Separating different concepts of the topic, as well as keywords of the compiled research questions, allowed the researcher to search the computerised databases of the University of South Africa (UNISA) libraries for books, journals, short dissertations, research reports, dissertations and theses relating to the topic. A search was also conducted on the Internet. De Vos *et al*. (2011:133) state that the Internet is a powerful means of making new and recent information, such as policy documents, official documents, speeches or press releases, readily available. The researcher also searched the online computerised databases of the UNISA library website that are most frequently viewed by social science researchers, such as ProQuest, Google Scholar, the and Social Science Citation Index, among others. The Internet was also used to search keywords and topics, in order to find reading material relating to this research topic, and relevant to this research.

- The UNISA library branches at Durban, KZN Regional Office, as well as other libraries in and around the Durban Central Business District (CBD) and surrounding areas, were visited, in order to find books, journals, statutes, articles and any other written material related to this research. An intensive electronic search was also conducted on the Internet in order to find material relating to this research. The researcher finally perused the relevant literature obtained, and the literature directly relating and central to the researcher's study, was duplicated for further perusal.

Throughout this process, the researcher continually strived to obtain a sense of whether the obtained literature would make a useful contribution to the researcher's understanding of the literature obtained in the study. Leedy and Ormrod (2015:372) support the views of De Vos *et al*. (2011:134) and Creswell (2009:29), stating that, in any literature review, the researcher is likely to draw on a variety of resources, including books, journal articles and Internet websites (which were consulted by the researcher, as seen above).

1.12.2 Semi-structured One-on-One In-Depth Open-ended interviews

Interviews were conducted with participants from both samples "A" and "B" of the target population, as it is an effective and accepted data collection method in qualitative research (Bless *et al*., 2013:23) supported by Leedy and Ormrod (2015:277). Mack, Woodsong,

MacQueen, Guest and Namey (2005:29) state that In-depth open-ended interviews can take place via a phone conversation but are usually conducted face-to-face involving one interviewer and one participant. In this research, One-on-One In-Depth Open-ended interviews were conducted with face-to-face contact as it had the distinct advantage of enabling the researcher to establish a rapport with potential participants, and thereby gained co-operation, thus yielding the highest response (Leedy & Ormrod, 2015:160). Mack *et al.* (2005:30) go on further to say that in-depth interviews are an effective qualitative method for getting people to talk about their personal feelings, opinions and experiences.

All the participants gave their verbal and written consent, as per the consent statement (attached as Annexure "A"), to participate in the interview process. Interviews took place in private, behind closed doors. During the interviews, the researcher used a tape recorder to capture the participant's verbal responses. The use of a standard schedule to conduct interviews minimised variability from one participant to another, and the data collected was easily compared (Robson, 2000:91). The three fundamental types of interviews in qualitative research are informal interviews, semi-structured interviews and structured interviews (Robson, 2000:88).

The participants from both samples"A" and "B" were asked the same questions, in order to address both research questions. In order to answer both research questions clearly, the researcher tested participants from Sample "A" on their knowledge of the topic. This was done, as they were not experts in the field, but could provide information relevant to the study. Participants from Sample "B"provided relatively correct answers in addressing the research questions, as they were experts in the field and official SAPS photographers and forensic fieldworkers.

Using a semi-structured interview schedule allowed the researcher to identify a specific set of questions in advance, as well as to ask more questions to clarify points touched on by any of the participants during the interview (Leedy & Ormrod, 2005:147-149). According to Welman and Kruger (1994:159), supported by Leedy and Ormrod (2015:160), semi-structured interviews allowed the researcher to follow the standard questions. Unclear questions that were vague or incomplete were explained to the participants by the researcher, and the responses were followed up and clarified. This was done by the researcher developing one or more individually tailored questions to get clarification or to probe a person's reasoning (Leedy &

Ormrod, 2015:160). Interviews were conducted using a semi-structured interview schedule with open-ended questions (Robson, 2000:88). The interview schedule consisted of numerous open-ended, pre-determined questions that explored various areas of the research topic. Bless *et al*. (2013:209) state that open-ended questions allow participants to freely express their answers in a short or long form, or in any way they may feel appropriate.

As suggested in Bless *et al*. (2013:197), semi-structured interviews are very helpful when conducting a pilot study prior to the formulation of a final questionnaire. The researcher conducted pilot studies with a detective commander and four (4) detectives from Montclair SAPS, in order to establish the effectiveness and accuracy of the interview schedule. This was done to ascertain whether there was any positive feedback on the interview schedule (Bless *et al*., 2013:107). The commander and four (4) detectives interviewed were not part of any sample, and the only aim of this exercise was to ensure that the responses to the interview schedule were accurate. The interview schedule had to capture the required information, and the questions had to be clearly understood by the participants.

Upon completing the final interview schedule, the researcher used the following guidelines by Leedy and Ormrod (2015:282-286) to conduct the interviews with the research participants:

- **Identify general interview questions and possible follow-up sub-questions in advance**
  The semi-structured interview schedules were the same for both samples "A"and "B" and consisted of open-ended questions that allowed the participants to freely expresss themselves. The semi-structured interview schedules were developed taking into consideration the research aim and research problem. Further sub-questions supporting the main questions were posed, to clarify and support the questions in the interview schedule, which is attached as per Annexure "B".

- **Consider how participants' cultural backgrounds might influence their responses**
  Samples "A" and "B" were multi-racial and multi-cultural, all being members of the SAPS. Their culture did not influence this research in any way whatsoever, as the research was limited to their professional experiences as members of the SAPS, and not of that in their personal or private capacity.

- **Make sure the sample includes people who give one the kinds of information one is seeking**

  The participants of this research were SAPS detectives and CST'S. These samples are directly involved in the investigation and reconstruction of murder cases/crime scenes, and could therefore offer information that was relevant and important to this research. All participants in the study were asked the same questions, in an attempt to get the right answers to the research questions.

- **Find a suitable location**

  All participants from both samples "A" and "B" agreed to be interviewed at their place of employment, as it proved to be convenient for them. The boardroom was used in the Durban LCRC, and the members' offices were used at their respective police stations. The doors were closed, and a "do not disturb" sign was placed on the door for the duration of the interview.

- **Obtain written permission**

  Prior to conducting the interviews, written and verbal consent was also obtained from the participants in the form of an informed consent form which is part of the interview schedule, and attached as Annexure "A" of this research. Permission to interview the participants was also obtained from the office of the SAPS Divisional Commissioner: Research, which is attached as Annexure "C" of this research.

- **Establish and maintain rapport**

  The interviews were held in a very informal way. The researcher explained to the participants the reason for the interview, and, out of courtesy towards the participants, continually asked the participants if they were comfortable. This seemed to make the participants feel at ease during the interview. When answers were given by the participants, the researcher displayed compassion for those answers, encouraging the participants to continue.

- **Focus on the actual rather than the abstract or hypothetical**

  The researcher asked the participants questions on the value of forensic science in crime scene reconstruction, and on how photography can be used to improve and/or conduct crime scene reconstructions.

- **Do not put words in people's mouths**

  The researcher did not interrupt the participants while they were giving their answers and expressing their thoughts and views. The researcher also did not influence or guide the participants, while they were providing the researcher with information on the subject under investigation.

- **Record the responses verbatim**

  The researcher used a tape recorder to capture the participants' responses in the interview.

- **Keep one's reactions to oneself**

  In order to obtain accurate information, the researcher did not show surprise towards, or approval or disapproval of, the participants' responses.

- **Remember that one is not necessarily getting the facts**

  The researcher treated the responses of the participants as perceptions and opinions, and not as facts, until it was proved otherwise.

1.13 DATA ANALYSIS

Neuman (2000:426) states that data analysis is the search for patterns in data such as objects, recurrent behaviours or a body of knowledge. Sharing a similar view, Mouton (2001:108) adds that analysing data involves breaking up the data into manageable patterns; themes and relationships. Leedy and Ormrod (2005:150) maintain that in a qualitative study there is no single correct method of analysing data. According to De Vos *et al*. (2002:139), data analysis is the process of bringing structure, order and meaning to the mass of collected data. The data collected by means of literature and interviews was for the researcher to reach the correct findings and recommendations. In this research, the data analysis spiral method was used to

analyse the raw data. Following the approach of Leedy and Omrod (2013:158), the researcher followed the phases of the data analysis spiral method, as follows:

- Raw data was collected by means of interviews and literature. The data was then analysed, and the researcher used markers and notes to extract relevant data pertaining to the research by breaking down the information into sentences and stories.

- The researcher sifted through the data several times to obtain an overall understanding of its contents. The data was categorised and filed, allowing the researcher to interpret and identify any variations in the data.

- The data was categorised according to individual categories, in order to classify the information in relation to its relevance to the research questions. The data was individually categorised into sections relevant to forensic investigation, criminal investigation and forensic photography.

- Lastly, the data was integrated and summarised into chapters that addressed a specific research question.

The purpose of conducting the above processes was to analyse the collected data and to group together what belonged together. This enabled the researcher to form a clear picture of what information was gathered on the relevant research questions that addressed the research aim.

1.14 METHODS TO ENSURE TRUSTWORTHINESS

The validity of the overall research includes its general credibility and trustworthiness, to the extent that other individuals perceive the study's findings to be convincing and worth taking seriously (Leedy & Ormrod, 2015:336). Bless *et al*. (2013:226) maintain that the quality of qualitative research is evaluated through its trustworthiness, on the basis of credibility, transferability, dependability and conformability. Bless *et al*. (2013:238) state that when credibility, dependability, transferability and conformability are all high, one can speak of the research being highly trustworthy, or having high quality. The researcher maintains that

credibility and transferability is closely associated with validity, while dependability, and conformability are closely associated with the reliability of the research and will discuss this next under ‘methods to ensure reliability'.

1.14.1 Validity attainment

According to Denscombe (2002:100), validity is about the accuracy of the questions that are asked, the answers given and the data that is collected. Generally speaking, it relates to the data and the analysis of the data used in the research project. Validity is important, as it ensures that the research is not established on poor quality data or incorrect interpretations. Leedy and Ormrod (2015:262) opine that the measuring instrument is valid as long as it measures what is meant to be measured. Following the strategies in Creswell (2013:250-253), the researcher did the following to ensure validity:

- ***Prolonged engagement and persistent observation:*** The researcher had a working relationship with some of the participants in the study, and knew them on both a personal and professional level. The researcher only used information that was relevant to the purpose of the study.

- ***Triangulation:*** The researcher made use of multiple documentary sources, methods, interviews, observations and theories to provide corroborating evidence. The collection of corroborating evidence from different sources allowed for light to be shed on a theme or perspective. This allowed data to be collected from different sources, triangulating the information and providing validity to the findings. Cresswell (2013:253) states that a researcher should engage in at least two procedures in any given study. Triangulating data from different sources, writing with thick, rich description, and peer reviews, all allowed for this research to be considered as valid.

- ***Peer reviews or debriefing:*** This provided an external check of the research process. Peer review allowed for an individual, who was a peer, to read the research and keep the researcher honest, ask hard questions about methods, meaning and interpretations, and sympathetically listening to the researcher’s feelings.

- ***Rich, thick description:*** These allowed readers to make decisions regarding transferability, because the writer describes in detail the participants or settings under study. 'Thick description' means that the researcher provides details when describing a case or when writing about a theme.

- ***Clarifying researcher bias:*** From the outset, it was important that the researcher's comments, past experiences and bias did not impact on the approach and outcome of the study.

1.14.1.1 Credibility

De Vos *et al*. (2011:419), supported by Bless *et al*. (2013:236-237), state that credibility is the alternative to internal validity. The goal with credibility is to demonstrate that the research was conducted in a manner whichensuredthat the participants were accurately identified and described. The credibility of qualitative research is increased through prolonged engagement and persistent observation in the field, by triangulating different methods and making use of formalised qualitative methods. The researcher ensured that the qualitative phase of this research was undertaken by using formalised qualitative methods such as conducting One-on-One In-depth Open-ended interviews with the participants, and by guaranteeing triangulation of the data throughout this research, thus ensuring the credibility of this study. The researcher found that the participants in both samples "A" and "B", as well as the literature reviewed, portrayed the findings of this research to be factual and trustworthy, hence ensuring that the findings of this research could be used for educational and training purposes.

1.14.1.2 Transferability

Transferability requires the researcher to provide detailed descriptions of the context in which the data was collected, about the researcher as a person, and about their relationship with the participants, among others (Bless *et al*., 2013:237). The researcher collected data using interviews and a literature review. The researcher is an employee of the SAPS, with eleven (11) years' service. He had seven (7) years' experience as a CST, and had a working relationship with the participants from Sample "B". The researcher did not know all the participants from Sample "A".

1.15 METHODS TO ENSURE RELIABILITY

Denscombe (2002:100) states that reliability evaluates the data collection methods and techniques that were used in the research. Reliability is the manner in which the data is collected during the research, and, specifically, about the fact that data should be consistent, and not alter or misrepresent the findings of the research. Reliability involves an evaluation of the specific methods and techniques used to collect data during the research project (Denscombe, 2002:100). Collins and Hussey (2003:58) explained that reliability refers to the findings of the research, and, together with validity, determines the credibility of the findings derived from the research conducted. Zikmun, Babbin, Carr and Griffin (2013:154) explain that replication means that the same results and conclusions will be drawn if the study is repeated using the same methods, but by a different researcher at a different time, using different participants. In other words, the same conclusion must be reached, based on another researcher's interpretation.

Creswell (2013:253) states that reliability can be enhanced if the researcher obtains detailed field notes by employing a good-quality tape recorder for recording the interviews. The tape also needs to be transcribed, to indicate the trivial, but often crucial, pauses and overlaps. The responses of the participants from samples “A” and “B” in this study were in writing, recorded verbatim by the researcher during the interviews. Creswell (2013:254) goes on further to say that codes must be given to text segments that have the same, exact passages.

1.15.1 Dependability

Botes (2003:183), supported by Bless *et al*. (2013:237), stated that 'dependability' is a concept used in qualitative research in relation to reliability. Trochim and Donnelly (2007:149) (as cited in Kumar, 2011:185) stated that dependability is concerned with whether one would obtain the same results if one observes the same thing twice. Bless *et al*. (2013:237) further advise that the researcher must show that each step has been completed thoroughly and carefully. The researcher accurately reported on the information contained in the literature and the viewpoints of the authors. Further to this, the researcher accurately reported on the responses of each participant to all the research questions. Bless *et al*. (2013:237) add that if the researcher wants one to trust that the results are dependable, then

they must describe the sampling method in detail, explain exactly how the data was collected, recorded, coded and analysed, and then present good examples to illustrate the process. The researcher has explained in detail how the participants from samples "A" and "B" were selected by using the simple random method. The researcher further used a tape recorder to record the responses of the participants, which were later transcribed. The responses were then captured on a spreadsheet, which made it easier to sort and analyse the participants' responses. Literature relevant to the research concepts and research questions was coded together using code words employed during the research, and can therefore be regarded as reliable. The literature – that is, authors and sources, that were consulted and used, were also acknowledged throughout this research.

1.15.2 Confirmability

Kumar (2011:185) maintains that 'confirmability' refers to the degree to which the results could be confirmed or corroborated by others. Kumar (2011:185), supported by Bless *et al*. (2013:237), states that in order to ascertain confirmability, other researchers must be able to obtain similar findings by following a similar research process in a similar context. The researcher must also present a critical evaluation of the methodology used. The literature consulted for this study was recorded accurately, and in a detailed manner. The findings of this research were based on the literature and the responses of the participants. The researcher remained objective throughout this research, and if this research were to be conducted by another researcher in the same manner as it was during this study, the researcher is confident that the results would conform to the current research.

1.16 BRACKETING

Creswell (2013:83) states that a new definition of bracketing is to be suspending one's understandings in a reflective move that cultivates curiosity, allowing the researcher to decide on how, and in what way, their personal understandings were introduced into the study. Tufford and Newman (2010:82) states that the process of tapping the essence of experience and looking beyond preconceptions became known by various interchangeable terms such as phenomenological reduction, epoche, or bracketing. Tufford and Newman (2010:82) go on further to say that many phenomenologists who worked under Husserlin Husserls ideas

(1930/1931) went onto develop their own ideas and approaches. One of the students in the programme rejected the concept of phenomenological reduction and argued that fully comprehending the lived experience was, in essence, an interpretative process and that bracketing out preconceptions was neither possible nor desirable. The researcher's views and eleven (11) years personal experience was bracketed in this research as the researcher gave his viewpoints and shared his personal experiences throughout this research.

1.17 ETHICAL CONSIDERATIONS

Mouton (2001:239) reports that ethical issues arise from one's interaction with other people and the environment. 'Ethics' is linked to the concept of morality, and deals with what must be or not be done (Denscombe, 2002:174-175). In order to adhere to UNISA's policy on research ethics, the researcher made an application to the UNISA College of Law Research Ethics Review Committee for permission to conduct the said research using UNISA's policy. The researchers' application was successful, and an ethics clearance certificate was issued to the researcher. The certificate is attached as per Annexure "D" of this research.

Further to this, the researcher reported his findings completely and honestly. He made no misrepresentations pertaining to the research, and did not mislead others about the nature of his findings. The researcher also took cognisance of, and guarded against plagiarism, which is seen as a form of academic fraud, which, according to Repanovici, Barbu and Cristea (2008:74), is the presentation of the work of any other author that provides its readers with reasons to think such work is one's own. This is regarded as plagiarism. Throughout this research, the researcher has given the necessary credit to the authors whose work was used in the research, and a complete list of sources have been referenced in accordance with the prescribed referencing method for UNISA (UNISA, 2004). This research is the original work of the researcher.

As a mark of respect for his professional colleagues, the researcher personally approached the participants from samples "A" and "B", and informed them of the purpose for which they were asked to be interviewed. The researcher also ensured that the participants understood that they were not obliged to participate in an interview and the data collection process, but

could do so voluntarily. The researcher also informed the participants that whatever they said during the interview would be recorded. The researcher also ensured confidentiality, and informed the participants that whatever information they revealed to the researcher would not be divulged to any person, thus preventing harm to any of the participants.

The researcher studied the UNISA policy on research ethics (UNISA, 2007:1) and adhered to the following aims of the policy:

- To contribute to an ethical and scientific intellectual culture of UNISA.

- To ensure that the rights and interests of human participants are protected. This is particularly important where information gathered has the potential to invade the privacy and dignity of participants, and where participants are vulnerable owing to their youth, age, poverty, disease, ignorance or powerlessness.

Leedy and Ormrod (2001:101-103) provided the following ethical issues that should be adhered to when conducting a research study:

- **Protection from harm:** The researcher made sure that the participants in this study were protected from risk or harm of any nature (De Vos *et al*., 2002:62). The researcher did not cause any psychological or physical harm to the participants. The participants were not exposed to any risks that were considered to be greater than the risks in normal, day-to-day living. The participants were also not undermined, embarrassed or made to feel uncomfortable.

- **Informed consent:** According to SAPS National Intruction 1/2006, Research in the Service, an application must be made to the SAPS to conduct research in the service. Upon receiving an application to conduct research in the service, the SAPS will consider an application to conduct research in the service. In terms of SAPS National Intruction 1/2006 the researcher made an application to the SAPS to conduct this research, after which the researcher was granted permission from the SAPS Divisional Commissioner: Research to conduct this research (Annexure "C"). Further to this, the participants were

informed that they could take part in the interview, freely and voluntarily. The participants were informed that their participation in the interview process was subject to their approval. The participants were also informed as to what the interview was about and what it would entail. The interview schedule was signed by each participant, prior to the interviews being conducted (Annexure "B"). Each participant was informed of their right to withdraw at any time before, during or after the interview session.

- **Right to privacy:** The participants were informed that their names or responses would not be used or contained in the research. For this reason, the researcher referred to them as “Participant 1”, “Participant 2” and so on.

1.18 RESEARCH STRUCTURE

Employing an integrated approach, the data collected from the literature and interviews were combined to obtain a better understanding of the value of forensic science in crime scene reconstruction. An integrated approach, according to the viewpoint of the researcher, contributed to a better understanding of the use forensic photography in murder scene reconstructions. The research questions of this research study were divided into the following chapters:

- **Chapter 2: Role of forensic science in criminal investigations**
  This chapter discusses what forensic science is, and how it can be used in criminal investigations.

- **Chapter 3: Use of photography in the reconstruction of a crime scene**
  In this chapter, the researcher shows how photography can be used to reconstruct murder crime scenes.

- **Chapter 4: Discussions, conclusion and recommendations**
  In this chapter, the final findings and conclusions of each previous chapter are discussed. Recommendations are given for future research, and for improvements and utilisation of forensic photography in murder scene reconstructions.

1.19 SUMMARY

In this chapter, the scientific and academic standards of this research were discussed in detail. The use of the scientific methods and management of research techniques used to conduct this research were discussed in length. In the next chapter, the researcher discusses forensic science, the works of the FSL, criminal investigations as well as the objectives and purpose of criminal investigations. Crime scenes and crime scene management will also be discussed, together with the duties and the role of the SAPS detectives and CST'S on murder crime scenes.

CHAPTER TWO
THE ROLE OF FORENSIC SCIENCE IN THE INVESTIGATONS OF CRIME

2.1 INTRODUCTION

A fundamental understanding of forensic science or criminalisitics is most often required for an investigator to understand the basic techniques for the collection and preservation of physical evidence. According to Prinsloo (1996:39), criminalistics can be defined as the scientific application of various methods and techniques that uncover and resolve criminal actions. Criminalistics often relies on highly sophisticated and advanced methods and techniques to keep abreast of any technological advances made in the field of forensic science. Lyman (2011:10) states that criminalistics is the application of various sciences to answer questions relating to the examination and comparison of biological evidence, trace evidence, impression evidence (such as fingerprints, ballistics, firearm and tool mark examinations), as well as any other evidence, in criminal investigations. Orthmann and Hess (2013:8) refer to criminalistics as specialists trained in identifying and interpreting the minute details of physical evidence, and further state that criminalistics is a branch of forensic science, which is a broader field encompassing the application of science to the law. In this chapter, the researcher discusses the first research question by providing an in-depth discussion on forensic science and criminal investigations (criminalistics), as well as crime scenes and crime scene investigation.

2.2 THE NATURE OF FORENSIC SCIENCE

Tilstone, Savage & Clark (2006:1) stated that forensic science is difficult to define. Broadly speaking, forensic science is the application of scientific techniques and principles to provide evidence to legal or related investigations and determinations. According to White (2010:1-2), forensic science can be defined as "*a science that is used for the purposes of law and that may constitute and include any avenue of science that is used to resolve legal disputes*". Fantino (2007) (in Orthmann & Hess, 2013:8) supports the view of White (2010:1-2) by stating that forensic science"*involves applying scientific processes to solve legal problems, most notably within the context of the criminal justice system*".

The United Kingdom (UK) Forensic Science Regulator (S.a) (in White, 2010:2) expands the definition of forensic science further, by stating that forensic science can be any technical and/or scientific knowledge that is applied to criminal investigation. Evaluating evidence assists the courts in resolving questions of facts (White, 2010:2). The term 'forensic practice' is now more widely applied, and referred to as the use of science to investigate crime. This practice is used by the police and the courts, in order to evaluate and analyse evidence to help resolve any issue that may arise at the time of trial.

Saferstein (2011:4) maintains that professionals who are working in the field of biology, anthropology, entomology, odontology, pathology, metallurgy and other related fields, and who use their skills to help law enforcement officials to conduct their investigations, fall under the 'umbrella' of forensic science. This is corroborated by Orthmann and Hess (2013:8), who clearly state that forensic science, covers a wide array of different disciplines that may include pathology, entomology, odontology, anthropology, serology, photography, toxicology and more.

From the above definitions, and following the guidelines by Horswell (2004:4), the following can be outlined as the basic meaning regarding the word "forensic":

- It refers to the application and use of science in criminal investigations and court proceedings.

- It includes forensic science, which deals with laboratory analysis, as exhibits/physical evidence collected at a crime scene are forwarded to a forensic science laboratory for analysis.

- Forensics is the application of both scientific and matrix skills to solve legal enquiries and criminal allegations.

- It is a field that is applied to law, in order to determine the modus operandi (methods and techniques) used by criminals when committing crimes.

- It includes the use of scientific investigative methods and techniques, in order to ensure that a thorough investigation is done in order to provide scientific evidence to prove the facts of a case and present such findings before a court of law.

- It is the process of applying and using scientific methods and techniques to conduct effective and accurate crime scene reconstructions.

Bell (2004:1) explains that the two words *forensic* and *science* each relate to the common theme – that of truth, either spoken or seen. In the modern world, this extends to speaking the truth in court.

In the view of Sample "A", the term 'forensic science' means the following:

- A scientific analysis of physical evidence found/collected from the crime scene (eight (8) participants)
- An aid to help the detective prove facts beyond a reasonable doubt (one (1) participant)
- Specialised use of methods to gather evidence (one (1) participant).

In the view of Sample "B", the term 'forensic science' means the following:

- The use of science and technology to solve and investigate crimes (six (6) participants)
- Analysis of physical evidence found on a crime scene, that can link the perpetrator to the crime scene (three (3) participants)
- Investigation of a crime scene using scientific methods to detect clues that can positively link the perpetrator to the crime scene for court purposes (one (1) participant).

The participants from Sample "A" related the term 'forensic science' mainly to the analysis of the physical evidence found on the crime scene, while the participants from Sample "B" understood the term 'forensic science' to mean the use of scientific methods and technology to investigate and solve crimes. The participants from Sample "B"saw forensic science as the comparison and analysis of physical evidence found on a crime scene to identify and link a perpetrator to a specific crime scene.

The viewpoints of participants from both samples differed slightly from one another as the participants from Sample "A" related their answers more to the collection of physical evidence found on the crime scene, while the participants from Sample "B" stated that forensic science involves the use of science to collect and analyse physical evidence, in order to identify a possible perpetrator. This relates to the structure of the SAPS, where detectives only attend the crime scene and assist LCRC personnel to collect physical evidence to be sent for analysis. The participants from Sample "B" had the view that forensic science involves linking the perpetrator to the crime scene, as they are often required to search and uplift fingerprints from the crime scene and then compare fingerprints to identify and link a perpetrator to that specific crime scene. Taking the literature into consideration, participants from both samples "A" and "B"concurred that forensic science describes the science associating people, places and things involved in criminal activities adjudicated in criminal and civil proceedings (Houck & Siegel, 2010:4).

2.3 THE WORKS OF THE FORENSIC SCIENCE LABORATORY

Police detectives and CST'S use scientific methods to observe and collect physical evidence at the crime scene. The detectives and CST'S carefully evaluate the scene and surrounding areas. The detectives will then develop a hypothesis in an attempt to answer the "*who, why, what, when and how did it happen"* questions. The CST will not form a hypothesis, and will instead send the evidence that they collected to the laboratory for further analysis (Brown & Davenport, 2012:7). In the researcher's experience, examples of evidence sent to the laboratory for analysis in murder cases can include blood for Deoxyribonucleic Acid (DNA) analysis, fingerprints uplifted from the crime scene for comparison on the Automated Fingerprint Identification System (AFIS) and firearms, spent cartridges and bullet heads for ballistic analysis.

Orthmann and Hess (2013:29) state that many criminal investigations involve the processing of physical evidence through a forensic crime laboratory. Brown and Davenport (2012:9) state that evidence collected at the scene is sent to the crime laboratory for analysis. As stated in Brown and Davenport (2012:9), forensic scientists at the crime laboratory specialise in fields such as chemistry, toxicology, pathology and firearms. The SAPS FSL was

established in January 1971, and consisted of three units, namely Biology, Chemistry and Electronics. In 1987, the Ballistics and Questioned Documents units were incorporated into the FSL. The Explosive Investigation Unit also amalgamated with the FSL in early 2000. Currently, in South Africa, the FSL comprises the biology, chemistry, scientific analysis, ballistics, questioned documents and explosives units (Omar, 2008:29). The main focus of the FSL is to apply scientific methods to an investigation.

Brown and Davenport (2012:9) state that forensic scientists at the crime laboratory must remain completely neutral, and not be biased in their analysis. Forensic scientists cannot form a hypothesis and draw conclusions about the guilt or innocence of the individual accused of committing the offence. Govender (2017:30) opines that science, as a method in itself, must be objective, and members of the FSL must perform their duties in a manner that adheres to the principle of not only bringing offenders to justice by being prosecuted for the offence which they are accused of, but to also prevent innocent people from being wrongly convicted of a crime as a result of improper crime scene examinations or physical evidence analysis.

A brief summary of the sections that fall under the SAPS FSL, as well as their main purposes, are as follows (SAPS, 2014b):

- **Ballistics:** Responsible for examining and analysing firearms, firearm parts and ammunition, as well as firearm-related crimes and crime scenes.
- **Scientific Analysis**: Responsible for examining organic and inorganic materials which may include electronics.
- **Questioned Documents**: Responsible for examination and analysis of handwriting samples, and can be used in document related crimes such as fraud and forgery and uttering.
- **Biology**: Responsible for examining and analysing blood, blood spatter patterns, hair and semen, as well as providing support and crime scene investigation services.

- **Chemistry**: Responsible for examining and analysing substances suspected to be drugs or poisons, and includes processing of drug-related crime scenes.
- **Explosives**: Responsible for examining and analysing scenes related to explosives, such as Automated Teller Macchine (ATM) bombings with arson investigations. Responsible for managing the SAPS bomb disposal ability (for example, bomb threats/scares).

When asked the question, "What is the role of the Forensic Science Laboratory (FSL) incriminal investigation?", the responses from the participants in Sample "A" were as follows:

- To assist the detective with the analysis of physical evidence found on a crime scene, in order to identify a possible suspect (ten (10) participants)

The participants from Sample "B" responded as follows:

- To analyse the physical evidence found on a crime scene in order toidentify a suspect (eight (8) participants)
- To analyse and compare physical evidence found on a crime scene (two (2) participants)

The participants from both samples "A" and "B" were of the same view as Orthmann and Hess (2013:29), who state that criminal investigations involve the processing of physical evidence through a forensic crime laboratory. The participants from both samples "A" and "B" were also of the same view as Brown and Davenport (2012:9), who state that the forensic science laboratories are used as an investigative aid to analyse and compare physical evidence found on a crime scene. As stated earlier in this research, this includes any physical evidence found on a crime scene – that is, blood, cartridge cases, bullet heads, firearms and primer residue, among other exhibits that may be found on a crime scene.

When asked the question, "What are the different divisions in the FSL?", the responses from Sample “A” were as follows:

- Biology, Ballistics, Chemical, Explosives, Scientific Analysis and Questioned Documents (seven (7) participants)
- LCRC, Biology, Chemical, Identikits, Ballistics, Questioned Documents (three (3) participants)

The responses from Sample “B” were as follows:

- Biology, Chemistry, Questioned Documents, Scientific Analysis, Ballistics and Explosives (eight (8) participants)
- Biology, Ballistics, Chemistry, Scientific Analysis, Identikits, LCRC, Explosives and Questioned Documents (three (3) participants)

Most participants from both samples “A” and “B”were aware of the different divisions in the FSL, comprising the Biology, Chemistry, Scientific Analysis, Ballistics, Questioned Documents and Explosives units (Omar 2008:30). There were three (3) participants from Sample"A" and three (3) participants from Sample "B" who stated that the LCRC and Identikits are divisions of the FSL. Omar (2008:29) differs from those participants, and states that the LCRC is not a division of the FSL, but falls under the function of the Criminal Record Centre (CRC). Omar (2008:30) adds that LCRC members are responsible for collecting evidence from a crime scene, ranging from taking photographs to removing spent cartridges or samples of bodily fluids left at a scene. The researcher is aware, from his experience, that some members from the LCRC are also responsible for compiling identikits of suspects.

2.4 CRIMINAL INVESTIGATIONS

In terms of Section 205 (3) of the Constitution (South Africa, 1996), the objectives of the SAPS are to achieve the following–

- Prevent, combat and investigate crime
- Maintain public order
- Protect and secure the inhabitants of the Republic and their property
- Uphold and enforce the law

Criminal investigations can be defined as a systematic search for the truth to resolve the criminal incident. It is also aimed at positively clearing up the crime situation based on objective and subjective traces (Gardner, 2005:2; Van Rooyen, 2004:6). Criminal investigation can be described as a process of finding, collecting, organising, identifying and presenting evidence that will help determine what happened, as well as identifying the person responsible for causing the incident (Orthmann & Hess, 2013:8).

Criminal investigations can also be referred to as the reconstructive process that uses deductive reasoning, based on exhibits and evidence at one's disposal, in order to establish whether the accused has, indeed, committed the alleged offence (Bennett & Hess, 2004:4). This is supported by Orthmann and Hess (2013:8), who state that criminal investigation is a reconstructive process that uses deductive reasoning, as well as a logical process, in which a conclusion follows from specific facts. Based on specific pieces of evidence, investigators establish proof that a suspect is guilty of an offence; for example, a suspect's fingerprints may be found at a murder scene, but the onus lies on the suspect to give a reasonable explanation as to why they were at the crime scene.

According to Bennett and Hess (2004:4-5) and Gardner (2005:23), the meaning of 'criminal investigation' is collectively outlined as follows:

- Protection of physical evidence and preservation of evidence regarding an alleged offence.
- Systematically searching for the truth about the alleged crime.
- Discovering the stolen items and identifying the culprits.

- Proving the suspect's innocence, and singling out the 'who', 'why', 'where', 'which' and 'what' questions.

When asked the question, "What is the meaning of criminal investigation?", the responses from Sample "A" were as follows:

- Criminal investigation is as a process of searching for the truth about alleged offences and presenting its findings in a court of law (four (4) participants)
- Criminal investigation means to investigate a crime (three (3) participants)
- Criminal investigation is a process whereby one has to gather evidence and identify the perpetrator, in order to unravel the truth (two (2) participants)
- Criminal investigation is to search for the truth, collect evidence, and interview witnesses and suspects (one (1) participant)

The responses from Sample "B" were as follows:

- Criminal investigation is the investigation of a crime that was committed (six (6) participants)
- Criminal investigation is to identify a suspect who committed a crime (two (2) participants)
- Criminal investigation is to gather evidence, identify and link a perpetrator to a crime (one (1) participant)
- Criminal investigation is about gathering the facts about a crime that was committed, and presenting its findings in a court of law (one (1) participant)

The participants in both samples "A" and "B" provided a wide variety of definitions of criminal investigation. The answers given by these twenty participants are close to the accepted definitions of criminal investigation, but some participants confuse this definition with the objectives of criminal investigation – which includes identifying the suspect(s). The participants' answers are only part of what criminal investigation entails. Although there is a minor variation in the definition of criminal investigation, the common understanding of the twenty (20) participants from both samples "A" and "B"and that of Van der Westhuizen

(1996:1), Pena (2000:1) and Bennett and Hess (2004:4), it is clear that criminal investigation is about systematically searching for the truth, gathering evidence, and presenting the findings in a court of law, thus justifying the point that there is no sizeable difference in the meaning of 'criminalinvestigation'.

The researcher is of the understanding that criminal investigation is not only a systematic search for the truth, but entails how and why that truth is searched. The process of criminal investigation is also based on the collection of exhibits, identification, processing and analysis of information, in order to solve an allegation or crime that was committed. This is supported by Osterburg and Ward (2010:5), who state that criminal investigation encompasses "*the collection of information and evidence for identifying, apprehending, and convicting suspected offenders*" as well as Marais (1992:1), who suggested that from the moment a crime is committed until the accused is found guilty or innocent in a court of law, crime investigation is a process of identifying physical objects and people.

2. 5 THE OBJECTIVES OF CRIMINAL INVESTIGATIONS

Van der Westhuizen (1996:4-7) was of the view that the objectives of criminal investigations involve identification of the crime, gathering evidence, individualisation of the crime, arresting the criminal, recovery of stolen property and involvement in the prosecution process. Van der Westhuizen (1996:4-7) was supported by Fisher (2004:48) and Gardner (2005:2) and, more recently, by Lyman (2011:15) and Orthmann and Hess (2013:11), all of whom add that the objectives of investigation also include establishing the fact that a crime has actually been committed, identifying the suspect(s), preparing a sound criminal case for prosecution, and bringing the culprit before court to account for his activity in the alleged offence.

According to Sample "A", the objectives of criminal investigation are to do the following:

- Solve a crime (six (6) participants)
- Identify that a crime has indeed occurred, and identify possible suspects (two (2) participants)

- Gather evidence (two (2) participants)

According to Sample "B", the objectives of criminal investigation are to do the following:

- Identify whether a crime has, in fact, taken place, and identify the suspect (one (1) participant)
- Identify a suspect (five (5) participants)
- Preserve the scene, gather evidence, and establish facts that relate to the crime committed, in an attempt to prove or disprove an allegation, and to then present the evidence in court (two (2) participants)
- Collect evidence from the crime scene, and then go to court to give evidence in an impartial manner (two (2) participants)

The participants from both samples "A" and "B" could not set out all the objectives of criminal investigation, as set out in Van der Westhuizen (1996:4-7), Lyman (2011:15) and Orthmann and Hess (2013:11) which are identifying the crime, gathering evidence, individualising the crime, identifying the suspect, arresting the criminal, recovering stolen property and being involved in the prosecution process. . The participants in both samples did, however, have a general understanding of the objectives of investigation. Although the participants in both samples mentioned some of the objectives as stated in the literature, the researcher shows some concern for the fact that not one of the participants mentioned the recovery of stolen property as an objective. From the discussion, it is clear that all the participants considered the objective of an investigation to be the establishment of the facts which prove or disprove the allegations, and to solve the crime by means of preserving and collecting evidence that will positively identify and link a suspect to a crime; however, the recovery of losses is an objective which seems to be less prominent among the participants.

2.6 THE PURPOSE OF CRIMINAL INVESTIGATIONS

The basic purpose of investigation is to prevent crime (Du Preez, 1996:1). Lyman (2011:21) shares the view of Du Preez (1996:1), stating that investigations are sometimes conducted as a preventative response, as convictions prevent the offender from committing crimes in the

future. Orthmann and Hess (2013:2) reveal the history of criminal investigation, identifying three major roles, the first of which is to prevent crime. The second role is to promote justice. The third role is to bring order into an otherwise disorderly environment. The researcher states that prevention through deterrence is sometimes achieved by arresting the criminal and by aggressive prosecution. By this, the researcher means that should the crime prevention units such as the SAPS Flying Squad, K-9, and other units in the Division: Visible Policing (VISPOL) fail to prevent crime, then it is the duty of the detectives to identify and arrest the suspect. By the detective arresting the suspect and preparing a solid case against him/her, the suspect will be convicted, and, hence, this will prevent the suspect from committing any further offences as he will be imprisoned.

To the question on the purpose of an investigation, the responses of Sample "A" were to do the following:

- To bring out the truth (three (3) participants)
- To investigate reports of a crime (two (2) participants)
- To identify the suspect (two (2) participants)
- To establish facts that will determine the outcome of the case (two (2) participants)
- To collect evidence and to bring the suspect before the court (one (1) participant)

The responses of Sample "B" were as follows:

- To gather evidence, establish the facts and come to a conclusion (one (1) participant)
- To gather evidence and identify the suspect (three (3) participants)
- To determine if a crime was committed (two (2) participants)
- To determine the cause of a crime (one (1) participant)
- To uncover the truth about the crime committed (two (2) participants)
- To solve a case (one (1) participant)

The participants from both samples "A" and "B" share the same view as O'Connor, Rausch, Albrecht & Klemencic (2008:154) and Braiden (2014), who state that the purpose of criminal investigation is to do the following:

- Investigate information or reports that raise a suspicion that a criminal offence has been committed.
- Uncover, preserve and collect evidence of criminal offences.
- Establish, with regard to a specific criminal offence, if a suspect can be identified.
- Determine whether sufficient reason exists for the prosecution of a suspect of a criminal offence.

The views of the twenty (20) participants, O'Connor *et al*. (2008:154) and Braiden (2014) concur on the objectives of criminal investigation.

According to Preez (1996:1) and Orthmann and Hess (2013:2), the basic purpose of criminal investigation is to prevent crime. This differs from the views of the twenty (20) participants in samples "A" and "B", together with O'Connor *et al*. (2008:154) and Braiden (2014), who closely associate the pupose of criminal investigation with the objectives of criminal investigation. The researcher shares the same view as Preez (1996:1) and Orthmann and Hess (2013:2) believing that the true purpose of criminal investigation is to prevent crime.

2.7 THE CRIME SCENE MANAGEMENT

The SAPS learner's guide on crime scene management (2009a:2) defines a "crime scene" as a place, including the surrounding area, where an alleged offence took place or was committed. The crime scene is the area where items with potential evidential value are found and collected. Van Rooyen (2004:94) defines a crime scene is as "*the actual site, area or location*" where an incident occurred. Additionally, a crime scene refers to the following:

> The apex of an inverted pyramid that extends to the investigation of a crime; as well as the recognition, analysis and interpretation of evidence that is presented at a court trial (Inman & Rudin, 2001:196).

Horswell (2004:3) states that any place can become a crime scene, and that a crime scene is usually the place where a crime or incident that has legal repercussions has occurred. Gilbert (2004:91) was of the same view as Inman and Rudin (2001:196) and Horswell (2004:3), stating that a crime scene is the place where direct or indirect evidence of a crime, or of an alleged crime, can be located. Adams, Caddell and Krutsinger (2004:3) maintain that a crime scene is not only where to get witness and victim information, but also where visible or invisible physical evidence that could assist in solving a crime, can be found. The information in the form of physical evidence and blood splatter must be clearly photographed, in order to keep a detailed and accurate record of the scene and how it was actually found. According to the literature, it is clear that a crime scene is the place where a crime was committed, and where physical evidence associated with the crime may be found (Fisher, 2004:29; Horswell, 2004:2). Genge (2004:3) indicates that a crime scene is not limited to the actual location of the crime, but also includes the staging and planning area. It can be the first place where the crime was planned or ended. Pena (2000:57) was of the opinion that the crime scene is the locale within the immediate vicinity of the occurrence wherein evidence may be found. Investigators should therefore not only focus on the place where the victim is found, but also pay attention to nearby bushes, verges and pathways, as this may have been an entry or escape route used by the perpertrator(s).

2.7.1 Classification of crime scenes

James and Nordby (2009:167) states that crime scenes are classified according to the location of origin of the initial criminal activity. The classification of the crime scene labels can be either a primary crime scene or secondary crime scene.

2.7.1.1 Primary crime scenes

Horswell (2004:3) states that a *primary* crime scene is the actual place where an incident occurred. Gardner (2005:67) agreed with Horswell (2004:3), and added that this also includes the entry and exit points used by the suspect. Palmiotto (2013:164) supports both Horswell and Gardner, explaining that a primary crime scene is the location where the body of a victim is found, or the point of entry or exit. Simply put, it is the scene at which a crime or event has taken place.

2.7.1.2 Secondary crime scenes

A *secondary crime* scene is a place or location where some of the victim-offender interacton occurred, but is not the actual place where the offence occurred (Turvey, 2012:291). Gardner (2005:68) and Horswell (2004:3) states that secondary crime scenes are places where physical evidence relating to the crime may be found. Horswell (2004:3) went further, stating that potential evidence is transferred from the primary scene to the secondary scene. In the researcher's experience, an example of this can be a motor vehicle that was recovered in a different area from where the victim was shot and killed in a hijacking. This vehicle will then have physical evidence such as fingerprints and the DNA of the suspects, as well as blood from the victim. A secondary crime scene is linked to the primary crime scene, where evidence and/or suspects are found, including the suspect's house, car and business (SAPS, 2009a:56).

When asked the question, *"*What is a crime scene?", the responses from Sample "A"were as follows:

- The place where a crime occurred (six (6) participants)
- The place where a crime occurred and where evidence can be found (four (4) participants)

The responses of Sample "B"were as follows:

- The place where a crime occurred and where physical evidence can be found (eight (8) participants)
- A place that includes the surrounding areas of where the crime occurred and is subject to investigation (two (2) participants)

The participants from both samples answered the question of their understanding of a crime scene with a very direct approach, stating that it is the place where a crime occurred and where physical evidence can be found and is subject to an investigation. This is in accordance with the SAPS policy on crime scene management (SAPS, 2009a:2). None of the twenty (20) participants from both Samples "A" and "B" went into detail on what is a crime scene and did not classify crime scenes into primary and secondary crime scenes.

2.8 THE CRIME SCENE INVESTIGATIONS

Crime scene analysis is a distinctive concept in forensic science. Crime scene investigation involves evaluating the context of a scene and the physical evidence found on a crime scene in an effort to identify what occurred and in what order or sequence it occurred (Gardner & Bevel, 2009:1). James and Nordby (2005:169) explain crime scene investigation not to be a mechanical process conducted by "technicians" through a series of steps used to "process a crime scene", but, instead, describes it as a dynamic process that requires an active approach by the crime scene investigator, who must be aware of the linkage principle of the evidence, and must use crime scene analysis methods and techniques in order to offer an opinion on the reconstruction of the crime.

When asked the question, "What is crime scene investigation?", the responses from Sample "A" were as follows:

- The process of collecting physical evidence from crime scenes (five (5) participants)
- The process of collecting physical evidence and documenting the crime scene (five (5) participants)

The responses of Sample "B"were as follows:

- The process of collecting physical evidence from crime scenes (six (6) participants)
- Processing and collection of physical evidence and documenting the crime scene (two (2) participants)
- Investigating the crime scene using scientific methods in order to collect physical evidence (two (2) participants)

Bertino (2012:24) explains that crime scene investigation is based on 'Seven S'as follows:

- **Securing the scene**: The first responder is responsible for cordoning off the scene. This is done in order to preserve evidence and to avoid contamination. Based on the Locard's principle of transfer, loss or contamination of evidence can occur if the crime scene is left unsecured.

- **Separating the witnesses**: This is done to ensure that witnesses do not work together to create their own version of the story.

- **Scanning the scene**: This needs to be done to establish what photographs need to be taken, and to ascertain whether it is a primary or secondary scene.

- **Seeing the scene**: The CST needs to see the scene from different angles. This allows for photographs to be taken of the overall area, as well as close ups with and without measuring units.

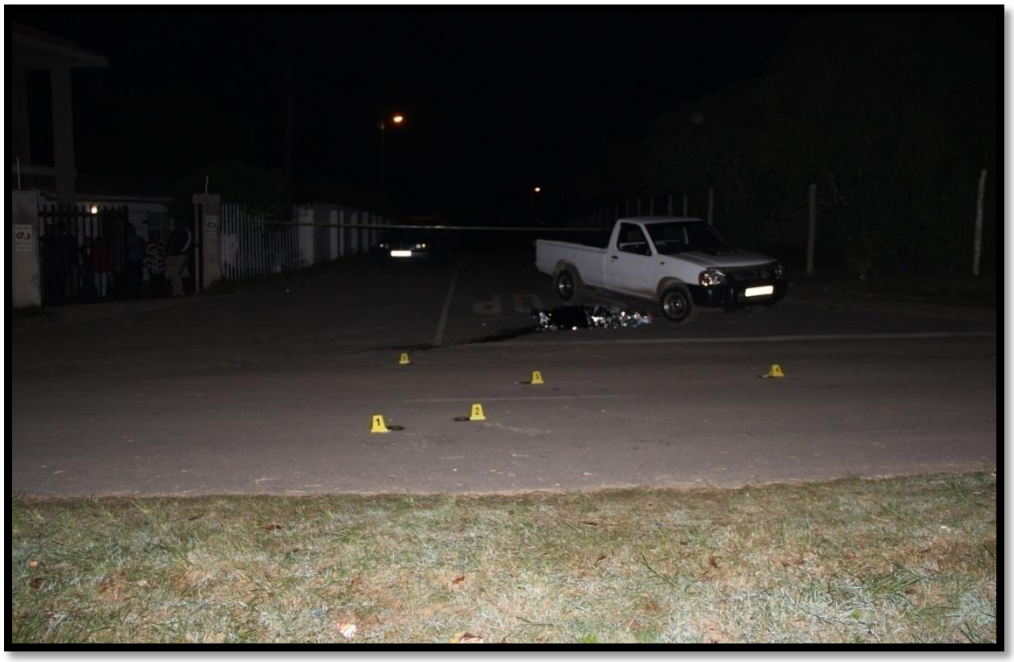

Figure 2.1: Depicts an overall view of a muder crime scene (Source: Reproduced by Durban LCRC with permission from KZN: Criminal Record and Crime Scene Management (CR & CSM), as per attached Annexure "E")

Figure 2.2: Depicts a mid-range photograph of a murder crime scene (Source: Reproduced by Durban LCRC with permission from KZN: CR & CSM, as per attached Annexure "E")

Figure 2.3: Depicts a close up photograph of an exhibit found on a murder crime scene (Source: Reproduced by Durban LCRC with permission from KZN: CR & CSM, as per attached Annexure "E")

- **Sketching the scene**: This allows for the CST to draw a rough sketch of the scene, noting the position of moveable and immovable items, as well as that of the deceased and exhibits, indicating the measurements between them.

- **Searching for evidence**: Using any of the four crime scene search patterns, the CST can identify and mark any potential physical evidence.

- **Securing and collecting evidence**: The crime scene expert needs to ensure that all evidence collected is properly packaged, sealed and labelled. The physical evidence collected must then be sent to the relevant FSL for analysis.

The participants from both samples "A" and "B" gave a satisfactory explanation of crime scene investigation, compared to that of the literature. Taking the views of the participants, as well as that of the literature, into consideration, the researcher concludes that crime scene investigation entails a systematic and scientific analysis of all the processes conducted in the preliminary investigation. Lyman (2011:26) states that the objectives of the preliminary investigation are to determine what has happened, locate witnesses and sources of evidence that aid in determining what had occurred, locate and preserve evidence, determine what further investigative steps need to be taken, obtain and evaluate the accuracy of witness statements, determine whether to act on the statements and evidence found at the scene, and record what has been done, what has been learned and what is left to be done.

2.9 THE USE OF FORENSIC SCIENCE IN MURDER INVESTIGATIONS

Brown and Davenport (2012:7) state that forensic science begins at the crime scene – the place where an incident took place. These authors further state that detectives rely on a scientific method to solve a crime. A scientific method is a series of logical steps used, in this case, to solve a crime. The scientific method used in murder cases will involve the crime being discovered by the police, who then arrive at the crime scene and process the scene, looking for clues, collecting exhibits, and sending the exhibits to the laboratory for scientific comparison and analysis. Brown and Davenport (2012:7) support the view of Horswell (2004:4) and James and Nordby (2005:169), by revealing that scientific crime scene

investigation is based on a scientific method – a method that is methodical and systematic. James and Nordby (2005:169) state further that crime scene investigation is based on the Locard exchange principle, logic, and the use of the scientific knowledge of forensic techniques applied in physical evidence examinations, in order to develop investigative leads that will ultimately solve a crime.

2.9.1 Locard exchange principle

Edmond Locard (d.1966) was a pioneer in forensic science, and his contributions to the field have proved invaluable. Pepper (2010:7) states that in 1910 Locard published his principle, suggesting that when one object comes into contact with another, something is exchanged between, and taken away by, both objects. Locard's principle is the basis of the transfer and recovery of all forensic evidence. Orthmann and Hess (2013:18) support the view of Pepper (2010:7), stating that Locard's exchange principle is a basic forensic theory which states that objects that come into contact with each other always transfer material, however minute, to each other. The Locard exchange principle usually provides leads for the investigators (Fish, Miller & Braswell, 2011:110). Locard proved that any action of an individual, and obviously the violent action constituting a crime, could not occur without leaving a trace (Wilding, 2012); therefore, this is prevalent mostly in contact crimes such as, for example, murder, rape, assault and kidnapping. The researcher states that the Locard principle is of the utmost importance, as the main reason for searching the crime scene is to find evidence based on this principle.

When asked the question, "How is forensic science used in the investigation of murder cases", the responses of Sample "A" were as follows:

- To help prove facts beyond a reasonable doubt (one (1) participant)
- To analyse the physical evidence found on a crime scene (four (4) participants)
- To determine the cause of death, document the crime scene, analyse the exhibits found on a crime scene and to identify and link the suspect to the crime scene (four (4) participants)
- To utilise specialised tools and aids to determine what happened (one (1) participant)

The responses of Sample “B” were as follows:

- Use of technology and forensic methods to investigate crime (one (1) participant)
- Collection and analysis of physical evidence to link a suspect to the crime scene and documenting and recording of the crime scene (eight (8) participants)
- Used to link a suspect to a crime scene using physical evidence (one (1) participant)

From Brown and Davenport (2012:2) and feedback from the participants, it is evident that the application of forensic science in any crime starts from the very point where a crime scene is discovered, up to the end of court proceedings. As stated in Orthmann and Hess (2013:46), the use of photography and plan drawing is a method under the discipline of forensic science that is used to document and record the scene, and to reproduce the crime scene in detail for presentation to the prosecution, defence and witnesses, and is used in investigation, prosecution and police training. The exhibits collected from the crime scene are then sent to the FSL for analysis, and to possibly ascertain the identity of the suspect or confirm the use and/or identification of a firearm used in the commission of the offence. From the researcher's experience, it can go on further into the reconstruction stage, where the photographs of the initial crime scene are then used to conduct blood pattern analysis.

2.10 THE ROLE OF THE SOUTH AFRICAN POLICE SERVICE DETECTIVES IN MURDER INVESTIGATIONS

The SAPS learning Guide (South Africa, 2009a:43) states that the investigating official is the member of the SAPS who is the principal investigator of a case, and has the responsibility of maintaining the case docket. In the researcher's experience, in the SAPS, the investigating official is commonly referred to as a 'detective'. Lyman (2011:26), supported by Orthmann and Hess (2013:11), states that the role of the detective involves determining what has happened, locating witnesses and sources of evidence that aid in determining what has occurred and what further investigative steps should be taken, obtaining and evaluating the accuracy of witnesses’ statements, deciding whether to act on the statements and evidence found at the scene, recording what has been done, what has been learned, and what is left to be done, conducting raids, surveillance, stakeouts and undercover assignments, identifying

and arresting suspects, and, finally, testifying in court. The SAPS learner's guide (South Africa, 2009a:46) contributes to the above, in that the detective must also attend the post-mortem, and assist the state prosecutor during the trial. The researcher concludes that it is the detectives' responsibility to fulfil the objectives of criminal investigation.

When asked the question,"What is the role of the detective in murder investigations?", the responses from Sample "A"were as follows:

- Gather relevant information about the crime and prepare for prosecution of the accused (one (1) participant)
- Safeguard evidence, ensure evidence is marked and collected, establish motive of the crime, identify the victim and witnesses, obtain statements, identify and arrest the suspect (three (3) participants)
- Take control of the crime scene, cordon off crime scene, ensure scene is not contaminated, ensure scene is documented by means of photography, ensure exhibits are collected, obtain witness statements, arrest the suspect and ensure witnesses are summoned to court (six (6) participants)

All ten (10) participants from Sample "B" stated that the detective must cordon off the scene, provide the first walk through of the crime scene, identify evidence, interview witnesses, obtain statements to prove the facts of the case, arrest the suspect, and bring the accused before court as stipulated in the SAPS learning guide (South Africa, 2009a:43). From the literature and the twenty (20) participants from samples "A" and "B", it can be concluded that the detectives' main role is to be actively involved in the investigation to ensure that the suspect is identified, charged and convicted for the crime which they have committed.

2.11 THE ROLE OF THE SOUTH AFRICAN POLICE SERVICE LOCAL CRIMINAL RECORD CENTRE PERSONNEL IN MURDER INVESTIGATIONS

In South Africa, in terms of Section 232 (1) of the Criminal Procedure Act (CPA) (Act No. 51 of 1977), any court may, in respect of any article other than a document, which any party to criminal proceedings may wish to produce to the court as admissible evidence at such proceedings, permit such party to produce as evidence, in lieu of such article, any photograph thereof, notwithstanding that such article is available and can be produced in evidence, an example of such would be photographs of a firearm found on a crime scene, as well as spent cartridges and bullet heads. Subsection 20 of the CPA states that the "State may seize anything" at a crime scene and seize certain articles in order to abtain evidence for the institution of a prosecution. These are the legislations that mandate the CST'S from the LCRC to capture the crime scene and collect exhibits at a crime scene.

Omar (2008:29-30) states that the function of the LCRC is the management of criminal records and the application of sophisticated techniques to recover physical evidence from crime scenes. There are ninety two (92) LCRC's located across the nine South African provinces. Omar (2008:30) further states that LCRC members are responsible for collecting evidence from a crime scene, ranging from taking photographs to removing spent cartridges, or samples of bodily fluids, left at a scene. The SAPS learning guide (South Africa, 2009a:50) adds to the above, in that the CST from the LCRC must also focus on reconstructing the chain of events, providing a realistic, visual representation of the scene in support of the judicial process, searching for, documenting and collecting physical evidence, identifying the perpetrator (s), and linking the perpetrator(s) to the crime scene. In the researcher's experience, members who are working in these LCRCs are referred to as the CST. A CST is considered to be an 'expert', depending on their training. A CST is a specially trained SAPS member, representing the LCRC, who assumes control over the crime scene, and processes it (South Africa, 2009a:55). In the researcher's experience, a CST is a member of the LCRC who has completed the relevant training. This training includes attending and completing an Advanced Crime Scene course within the SAPS, whereby the CST is trained in the investigation, processing, photographing, plan drawing, videoing and reconstructing of crime scenes. In this course the CST is also trained in the collection and preservation of

physical evidence. When a member from the LCRC is adequately trained, and has a minimum of two (2) years' experience in the field of crime scene investigation, they are eligible to appear before an adjudication panel. Upon the members of the panel being satisfied that the LCRC member meets the minimum requirements in terms of training, knowledge and experience in crime scene investigation, the LCRC member is then awarded 'expert' status in their field of crime scene investigation.

Sutherland (2009:1) states that an expert can be defined as a "*person with status of authority based on training, special skills and knowledge in a specific field*". This person is referred to as an expert in the field in which they specialise. Sutherland (2009:2) states further that the role of an expert witness in criminal investigation is to provide the court with the necessary scientific information required for the court to draw its own conclusions. An expert witness clarifies any disputes that may arise from the evidence in question, and therefore allows the court to understand the scientific criteria correctly. The SAPS Learning Guide (South Africa, 2009a: 50-51), Pepper (2010:11) and Orthmann and Hess (2013:11) all state that the role of the crime scene investigator – also known as the CST, in South Africa, includes the following:

- Photography or videoing of scenes of crime, victims, suspects and property
- Sketching of crime scenes
- Searching for, collecting, packaging and preserving physical evidence found on crime scenes
- Detection and recovery of finger-foot and palm prints at the crime scene
- Storage of physical evidence, preventing contamination, and forwarding of exhibits to the FSL for analysis
- Preparation of statements and presentation of evidence in court
- Reconstructing the chain of events
- Linking of suspects to crime scenes by means of fingerprints

The SAPS Learning Guide (South Africa, 2009a:48) states that the CST and their processing team are the "eyes and ears of the court" at the crime scene. Good management by the CST will ensure that a co-ordinated effort takes place, and that each expert has the time to conduct

a professional search, thereby increasing the chances of finding good quality physical evidence. This will, in turn, ensure that better results are obtained by the analysts at the FSL.

When asked the question, "What is the role of the LCRC personnel in murder investigations?", the responses from Sample "A"were as follows:

- To collect physical evidence and give evidence in court (one (1) participant)
- Is used as an aid to detectives to collect physical evidence (one (1) participant)
- To assist the detective in documenting the crime scene by means of photography, conducting primer residue tests, and collecting physical evidence such as blood, firearms and fingerprints (seven (7) participants)
- To photograph the crime scene, collect physical evidence, and forward the physical evidence to the FSL for analysis (one (1) participant)

The participants from Sample "B" responded as follows:

- To document the crime scene, collect exhibits, sketch crime scenes, forward exhibits to the FSL for analysis, and testify in court (five (5) participants)
- Apply expertise to thoroughly analyse/investigate crime scenes and provide testimony in court (one (1) participant)
- Ensure the crime scene is cordoned off, not contaminated, and then, document the crime scene, collect exhibits, sketch crime scenes, forward exhibits to FSL for analysis, and testify in court (one (1) participant)
- Collect physical evidence to link perpetrator to crime scene (two (2) participants)
- To collect physical evidence and reconstruct crime scenes (one (1) participant)

From the literature, and participants from both samples "A" and "B", it can be concluded that that the role of the CST'S from the LCRC are one of the most useful resources available to the SAPS detectives, as they can assist in positively identifying and linking the perpetrator to the crime scene. They are also a very useful aid to the court, as they present a visual representation to the court on how the crime scene was found.

2.12 SUMMARY

This chapter explored a clear understanding of the term 'forensic science', and dealt with criminal investigations, the objectives and purpose of criminal investigations, as well as that of a 'crime scene' and 'crime scene investigation'. The uses of forensic science in murder investigations, as well as the role of the SAPS detective and LCRC members, were also discussed. It is therefore evident that there is a direct relationship between forensic science and criminal investigations.

From the presented discussions, it has become evident that forensic science plays a vital role in identifying and linking a suspect to a crime scene. The CST'S and SAPS detectives have a clear understanding of forensic science and criminal investigation, and well as the role forensic science plays in identifying and linking suspects in murder cases. The value of forensic photography in crime scene reconstruction will be dealt with in the next chapter.

CHAPTER THREE
PHOTOGRAPHY AS PART OF FORENSIC SCIENCE USED IN THE RECONSTRUCTION OF MURDER CRIME SCENES

3.1 INTRODUCTION

Throughout the multiple disciplines of forensic science, and the many topics that fall under the discipline of forensic science, every section had one activity in common: forensic photography (Genge, 2004:216). Orthmann and Hess (2013:46) state that "*a picture is worth a thousand words*". Orthmann and Hess (2013:50) state further that the CST'S must take sufficient photographs to reconstruct the entire scene. Gardner and Bevel (2009:249) maintain that a crime scene is preserved in images, sketches, notes and physical evidence – each of which serves its unique function in preserving the scene. Gardner and Bevel (2009:249) add that although the crime scene itself no longer exists, the goal is to preserve it in such a way that it can be understood and virtually reconstructed if needed. In this chapter, the researcher discusses the meaning and purpose of forensic photography, as well as the evidential value of forensic photography and how it can be used in the reconstruction of murder crime scenes.

3.2 THE CONCEPTUALISATION OF FORENSIC PHOTOGRAPHY

Pepper (2010:30) states that photography is the recording of an image onto light sensitive film or an electronic sensor. Fisher (2004:79) explains that forensic photography entails the recording and documenting of items of physical evidence found at the crime scene, using a camera, in the same setting or conditions in which they were found by the investigator. Forensic photography, also referred to as crime scene photography, is an activity that records the initial appearance of the crime scene and physical evidence, in order to provide a permanent record for the courts (Miller & Massey, 2016:49).

Pepper (2010:30) states that crime scene investigators utilise their photographic skills on a daily basis to record evidence found on a crime scene. Pepper (2010:30) supports the views of Fisher (2004:79) and Miller and Massey (2016:49), stating that whether the evidence is

located inside or outside, during the day or night, and irrespective of the weather conditions, the photographs taken must be an actual, accurate, permanent record of the evidence as it was found. According to the Western Cape Government (2017) and Ogle (2004:48, 238 & 241), forensic photography includes methods of photographing the scenes of crimes, gunshot wounds, bite marks, weapons, trace evidence and autopsy procedures.

When asked the question, "What is the meaning of forensic photography?", the responses from Sample "A" were as follows:

- One (1) participant could not provide an answer to this question.
- To photograph the crime scene in order to keep a track record that can assist at a later stage of the investigation (three (3) participants)
- It is specialised photography conducted by LCRC members for court purposes (two (2) participants)
- It is used to reconstruct the crime scene (two (2) participants)
- It is to document the crime scene and record the place and position of exhibits (two (2) participants)

The responses from Sample "B"were as follows:

- Forensic photography is the taking of photographs of crime scenes, exhibits and injuries (five (5) participants)
- It is detailed photography of potential evidence and is used as a means to record the crime scene (one (1) participant)
- It is to document evidence and the crime scene for court purposes (three (3) participants)
- It is taking of photographs to reconstruct the crime scene at a later stage (one (1) participant)

Sixteen (16) of the twenty (20) participants were of a similar view to that of Fisher (2004:79), Pepper (2010:30) and Miller and Massey (2016:49), who state that forensic photography entails the recording and documenting of items of physical evidence found at the crime scene, in order to provide a permanent record for court purposes. Three (3) participants said that

forensic photography was used to reconstruct crime scenes, and share the view of Gardner and Bevel (2009:249), who state that images can assist in virtually reconstructing a crime scene, if needed, while one (1) participant did not know the meaning of 'forensic photography'. The literature on the meaning of forensic photography is fairly limited, as most literature offers information on the uses of photography in crime scenes, rather than the meaning of forensic photography.

3.3 THE PURPOSE OF FORENSIC PHOTOGRAPHY

Ogle (2004:35) states that the purpose of crime scene photography is to record the condition of the scene before alterations occur, while Orthmann and Hess (2013:46) maintain that the basic purpose of crime scene photography is to record the scene permanently, and, further, that photographs of crime scenes, taken immediately, and using the proper techniques in order to reproduce the entire crime scene, provide a factual record of high evidentiary value.

The SAPS module on basic photography for official photographers (South Africa, 2008:15) states that the primary function of crime scene photography is to provide a realistic reproduction of crime scenes and related exhibits to the courts. James and Nordby (2009:193) inform that crime scene photographs provide the judge and jury with a realistic visualisation of the conditions, and also relative positions of evidence and items of interest, at a crime scene. Lee and Harris (2000:80), supported by Robinson (2010:594), also opine that the purpose of photography is to do the following:

- Provide a visual record and representation of the crime scene and related areas.
- Record and document the initial appearance of the crime scene as it was found by the first responder, as well as the physical evidence found on the crime scene.
- Provide investigators, witnesses and other role players in the investigation with a permanent record and subsequent analysis of the crime scene.
- Provide a permanent record of the crime scene to the court, as photographs serve as a means of documenting the actual crime scene.
- Provide a permanent record of the place and position of objects and physical evidence found on the crime scene, for future use and reconstruction purposes.

- Clarify disputes or uncertainties concerning the crime scene and related matters, as it provides a visual representation of the actual crime scene, making evidence visible.

When asked the question, "What is the purpose of forensic photography?", the responses of Sample "A" were as follows:

- To document the crime scene and provide a visual representation of the crime scene for the courts, in order to give the court a clear understanding of the crime scene (five (5) participants)
- To reconstruct the chain of events that led to the crime (two (2) participants)
- To support the evidence found on the crime scene in relation to the crime committed (one (1) participant)
- To keep a precise record of the crime scene (one (1) participant)
- To keep a record of, and document, the crime scene, showing the place and position of physical evidence (one (1) participant)

The responses from Sample "B" were as follows:

- To indicate what was present on the crime scene, in order to provide a visual representation of the crime scene to the courts (four (4) participants)
- To document and keep a record of the crime scene (three (3) participants)
- To reproduce and depict the crime scene accurately (one (1) participant)
- To assist detectives and the court to determine the sequence of events that led to the crime (one (1) participant)
- To reconstruct the crime scene showing the chain of events (one (1) participant)

The twenty (20) participants from both samples "A" and "B" were of the same view as Lee and Harris (2000:80), Robinson (2010:594) and Orthmann and Hess (2013:46), who all state that the purpose of forensic photography is to keep a permanent record of the crime scene, in order to present a visual representation of the crime scene to the courts, and to give a clear indication of the place and position of physical evidence found on the crime scene.

Two participants in Sample A and one participant in Sample B are supported by Ogle (2004:35), who states that photography plays an important role in the efforts to reconstruct the events of the crime. Photographs capture physical aspects of evidence at the crime scene, which are amenable to reconstruction by a qualified professional; for example, photographs of bloodstain patterns are crucial to the reconstruction of those events that produced the patterns and their sequence. Pepper (2010:30) states that photographs of crime scenes are also used to refresh the witnesses' memories of the crime scene, and recall events and clarify statements of witnesses in court.

3.4 THE EVIDENTIAL VALUE OF FORENSIC PHOTOGRAPHY

As stated earlier in this research, in South Africa, in terms of Section 232 (1) of the CPA, any court may, in respect of any article other than a document, which any party to criminal proceedings may wish to produce to the court as admissible evidence at such proceedings, permit such party to produce as evidence, in lieu of such article, any photograph thereof, notwithstanding that such article is available and can be produced in evidence; an example of such would be photographs of a firearm found on a crime scene, as well as spent cartridges and bullet heads.

In terms of Section 232 (2) of the CPA, the court may, notwithstanding the admission under subsection (1) of the photograph of any article, on good cause require the production of the article in question, meaning that the court can request for the same firearm, spent cartridges and bullet heads be brought to court during the trial. Lyman (2011:46) states that a photograph entered into evidence must be accurate and correct. Lyman (2011:49-50), supported by Orthmann and Hess (2013:56), explains that there are three types of photographs. **Material photographs** relate to a specific case and subject. A material photograph is relevant, makes a substantive contribution, and has a legitimate and effective influence on the decision of the case. A **relevant photograph** helps explain and support testimony. A **competent photograph** accurately represents what it purports to represent. It is properly identified, and is properly placed in the chain of evidence and secured until court presentation.

When asked the question, "What is the evidential value of forensic photography?", the participants from Sample "A" responded as follows:

- It depicts the physical evidence collected and sent for analysis in relation to the crime scene (two (2) participants)
- Assists in identifying evidence that could have been overlooked and missed during the preliminary investigation (two (2) participants)
- To obtain an overall view of the crime scene (two (2) participants)
- Provides a digital image of the physical evidence found on the crime scene (two (2) participants)
- Two (2) participants did not have an answer to this question.

The participants from Sample "B"responded as follows:

- To reproduce the crime scene for the court (two (2) participants)
- Show the place and position of exhibits, deceased, and injuries to the deceased (two (2) participants)
- To assist the courts in determining the sequence of events that led to the crime (two (2) participants)
- To keep a permanent record of the crime scene (two (2) participants)
- To document the crime scene (two (2) participants)

Two (2) participants from Sample "A"said that the evidential value of forensic photography is to show the relationship of the physical evidence collected and sent for analysis, in relation to the crime scene, while a further two (2) participants said that it is to provide a digital image of the physical evidence found on the crime. This is supported by Lyman (2011:49-50) and Orthmann and Hess (2013:56), who state that material photographs are relevant to the case at hand, make a substantive contribution, and have a legitimate and effective influence on the decision of the case. Such photographs, in this case, will show the extents of force used by the attacker, as well as the position of a weapon should the victim have been armed. It will also contribute to the facts in question, should acting in self-defence be used as a defence mechanism by the suspect, at a later stage, during court proceedings. Two (2) participants did

not have an answer to this question, while the remaining fourteen (14) participants closely related their answer to the purpose of forensic photography, as discussed earlier.

3.5 THE DIFFERENT TYPES OF FORENSIC PHOTOGRAPHY

Orthmann and Hess (2013:51) state that in addition to crime scene photography, certain other types of photography play a vital role in investigations. For the purposes of this research, and photography that is directly related to the reconstruction of crime scenes, aerial photography, laboratory photography, Ultraviolet (UV) photography and 3D photography will now be discussed.

3.5.1 Aerial photography

Pepper (2010:41) states that on a number of occasions, an operational CST is called upon to take a series of aerial photographs from a police helicopter to record an evidentially outdoor murder scene. Orthmann and Hess (2013:52) also inform that investigators often use aerial photography to cover extensive areas such as the roads leading to and from the crime scene. Orthmann and Hess (2013:53) further explain that aerial photographs can be enlarged to show the relationships of streets and roads, and make reference to the John F. Kennedy assassination investigation, where the entire area was photographed to include points from which shots might have been fired.

Figure 3.1: An example of an aerial photograph. (Source: Reproduced by Durban LCRC with permission from KZN: CR & CSM, as per attached Annexure "E")

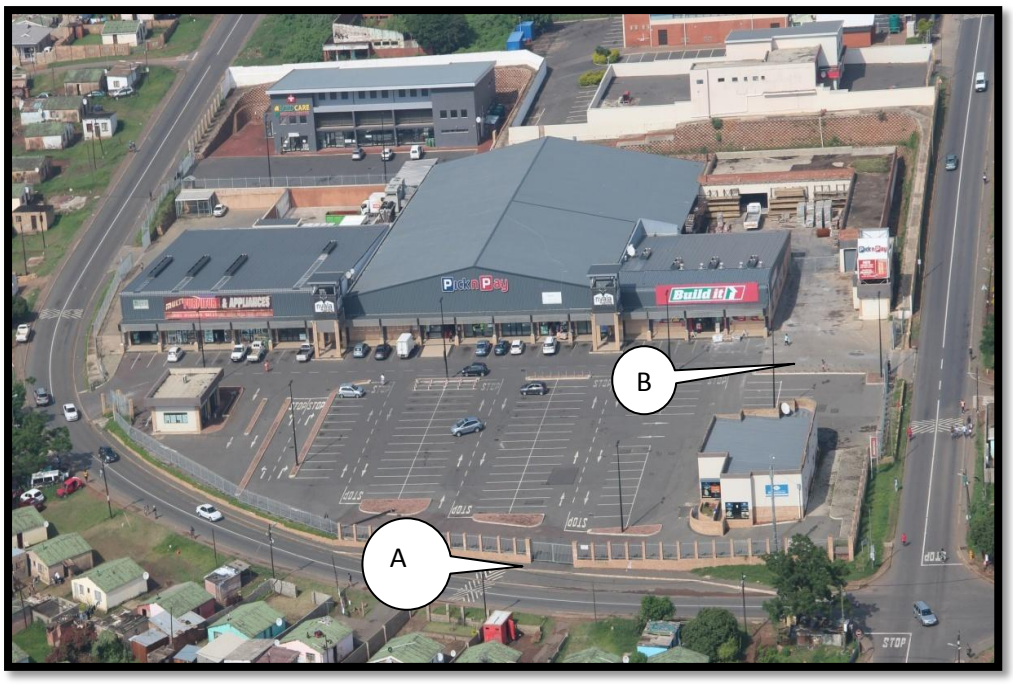

Figure 3.2: Is an example of how points of interest are then marked out in an aerial photograph. For example, Point A: Indicates the place at which the victim was stabbed and Point B: Indicates the place where the victim fell down and demised. The distances between the two points will also be measured. (Source: Reproduced by Durban LCRC with permission from KZN: CR & CSM, as per attached Annexure "E")

3.5.2 Laboratory photography

Orthmann and Hess (2013:53) explain that objects are sometimes photographed in the laboratory, using delicate, specialised and expensive equipment; for example, infrared film can reveal bloodstains and residue where a bullet has passed through clothing.

3.5.3 Ultraviolet Photography

Genge (2004:236), supported by Orthmann and Hess (2013:54), states that UVphotography uses the low end of the colour spectrum, which is invisible to the naked eye, to make visible impressions of bruises and injuries, long after their actual occurrence. Ogle (2004:48), supported by James and Nordby (2009:299), stated that UV photography is used to document materials that glow under UV light, such as blood, semen, saliva and certain fibres, and latent fingerprints dusted with fluorescent powders.

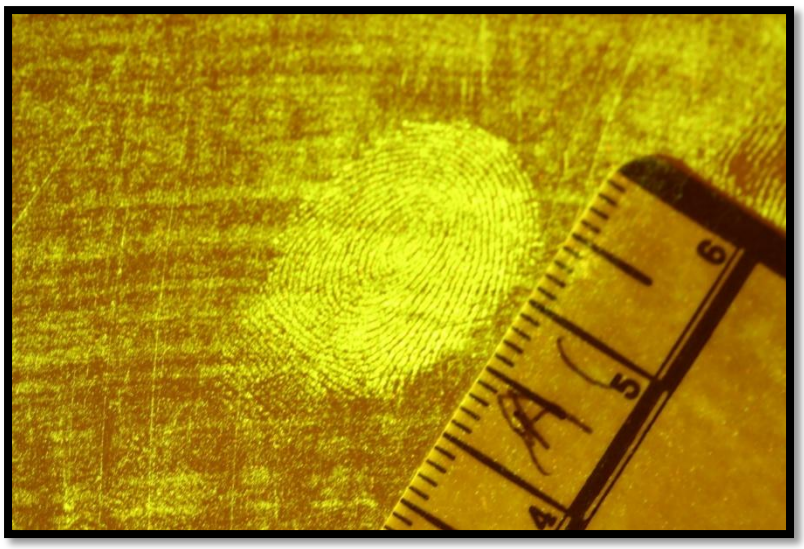

Figure 3.3: Depicts a latent fingerprint developed with a fluorescent powder and photographed using a Rofin crime light and single reflex lens camera. (Source: Reproduced by Durban LCRC with permission from KZN: CR & CSM, as per attached Annexure "E")

3.5.4 Three-Dimension photography

Gabriel (2016) state that the simplest way to define 3D photography is that "*it is a form of photography that captures and displays two offset images that are a little different from each other, so much so that they produce 3D images".* Gabriel (2016) futher states that 3D photography is much like putting two images together in a distance similar to that of one's eyes. Strandberg (2015) states that processing a crime scene, taking pictures, measurements, notes and more, can be a labourios and painstaking process; therefore, crime scene investigators employed the use of a 3D camera that is able to capture 360° X 180° spherical images in a single scan that is now used for crime scene documentation. Strandberg (2015) elaborates further by saying that:

> "The old days of recreating a crime scene using a tape measure and recording the information on paper are gone. Thanks to advancements in technology, diagramming and recreating a crime scene is done with Total Stations, Panoramic cameras and now 3D Scanners."

Strandberg (2015) adds that these cameras are good for picking up details and preserving evidence at a crime scene, and that the camera is more of a visual presentation tool to present

in court. When the images are shown in court, there is no doubt about what is being seen. It depends on what the evidence is. Although some evidence presents itself well visually, measurements and position of physical evidence are also required to accurately document a crime scene. These demands make way for portable 3D scanners that were developed and introduced for use in the evolving field of crime scene investigation.

When asked the question, "What are the different types of forensic photography?", the participants from Sample "A" responded as follows:

- Three (3) participants were not sure and could not answer the question.
- 3D Photography and crime scene photography (two (2) participants)
- Crime scene photography, 3D photography, ultraviolet light photography (three (3) participants)
- Aerial photography and crime scene photography (two (2) participants)

The participants from Sample "B"answered as follows:

- Ultraviolet light photography, night photography and aerial photography (one (1) participant)
- Crime scene photography and 3D photography (three (3) participants)
- Aerial photography and crime scene photography (four (4) participants)
- Ultraviolet photography, crime scene photography and post-mortem photography (one (1) participant)
- Aerial photography, infrared photography and 3D photography (one (1) participant)

Although three (3) of the twenty (20) participants were not sure of the different types of forensic photography, by combining the answers of the remaining seventeen (17) participants the researcher found that the literature supported the views of the seventeen (17) participants, as Genge (2004:232), Ogle (2004:42-48) and Orthmann and Hess (2013:52-54) state that the different types of forensic photography include crime scene photography, aerial photography, night photography, laboratory photography, UV photography and infrared photography. Ogle

(2004:238) includes post-mortem examination photography, which will be discussed further on in this dissertation.

3.6 THE VALUE OF PHOTOGRAPHS IN THE PRELIMINARY INVESTIGATIONS RECONSTRUCTION STAGE

Orthmann and Hess (2013:19) state that the investigative responsibilities during the preliminary investigation include the following: questioning victims, witnesses and suspects; searching for evidence; identifying, collecting, examining and processing physical evidence; measuring, photographing, videotaping and sketching the scene; and, recording all statements and observations in notes which will be used for future investigation and prosecution of the case.

Saferstein (2013:123) emphasises that photographs must be taken before the crime scene is altered at all, unless for life-saving efforts, as photographs will play a very large role when reconstructing the events later on. Orthmann and Hess (2013:50) concur with Saferstein (2013:123), and also recommend photographing a crime scene as soon as possible, while photographing the most fragile areas of the crime scene first. Orthmann and Hess (2013:50) explain that the CST must take sufficient photographs to reconstruct the entire scene. Orthmann and Hess (2012:50) add that this must be done by using a series of shots, starting from the entrance point, through to the commission of crime area and exit point, showing the crime scene in a pictorial sequence.

Orthmann and Hess (2013:50-51) inform that taking long range shots of entrances and exits, medium range shots of the immediate crime scene and location of objects of evidence within the area, as well as close range shots of specific evidence such as bloodstains and fingerprints, will reconstruct the commission of the crime. Ogle (2004:35) states that photography also plays an important role in the efforts to reconstruct the events of the crime. Ogle (2004:35-36) and Gardner and Bevel (2009:250), support that photographs of bloodstain patterns and items with bloodstain patterns are crucial to the reconstruction of those events that produced the patterns and their sequence. Ogle (2004:252) further reveals that accurate and thorough scene documentation of the crime scene is critical to the task of reconstruction.

Without appropriate and accurate photographs, sketches and reports from the crime scene processing team, it is usually impossible to provide a thorough and accurate reconstruction of that scene.

When asked the question, "How can photography during the preliminary investigation be of value in the reconstruction stage?", the participants from Sample “A” responded as follows:

- It shows the exact location and position of exhibits as they were found on the crime scene (three (3) participants)
- It presents the crime scene as it was found, and allows for the exact location of exhibits (two (2) participants)
- It provides an overall view of the crime scene (two (2) participants)
- Pictures of the initial crime scene allow the detective to look deeper into the scene and reflect on the events that led to the crime, and corroborates evidence from witnesses (two (2) participants)
- The initial crime scene is protected and cordoned off. The photographs taken during the preliminary investigation can assist when the scene is cleaned up and restored to its original condition (one (1) participant)

The participants from Sample “B”answered as follows:

- The photographs taken in the preliminary investigation will show the place and position of exhibits, and the condition in which the crime scene was found (five (5) participants)
- The initial photographs of the crime scene will show how the scene was found (two (2) participants)
- Not only the photographs, but also the sketch and measurements used in conjunction with the photographs taken in the preliminary investigation, will be of value when reconstructing the crime scene (three (3) participants)

Ogle (2004:35,252), along with Orthmann and Hess (2013:19), held the same view as the three (3) participants from Sample “B”, who state that photographs, in conjunction with sketches, capture the physical aspects of the crime scene that are amenable to reconstruction

by a qualified professional. None of the twenty (20) participants mentioned that it is vitally important to take close-up shots of physical evidence during the preliminary investigation, as it is the only means of preserving and protecting evidence such as bloodstains, fingerprints, tyre impressions and shoeprints, as stated by Ogle (2004:41) and James and Nordby (2009:176), who state that close-up photographs should be taken of all items where finer detail of the evidence is needed.

3.7 THE CRIME SCENE RECONSTRUCTION PROCESS

According to James and Nordby (2009:182), crime scene reconstruction is the process of determining or eliminating events that occurred at the crime scene, by means of analysis of the crime scene appearance, the locations and positions of the physical evidence, and the forensic laboratory examination of the physical evidence. James and Nordby (2009:182) add that crime scene reconstruction involves scientific crime scene investigation, interpretation of patterned evidence at the scene, laboratory testing of the physical evidence, a systematic study of related case information, and the logical formulation of a theory. Bertino (2012:29) states that crime scene reconstruction involves forming a hypothesis of the sequence of events from before the crime was committed, through its commission. The evidence is examined and compared with the witnesses' statements to determine the reliability of their accounts. The detective must look at the evidence and determine how it fits into the overall crime situation. Brown and Davenport (2012:370) support Bertino (2012:29), by stating that forensic investigators and scientists must formulate a hypothesis based on careful observations at the scene. The reconstruction may require modifications if the evidence and information do not support the hypothesis. Some reconstructions are relatively simple, but others require extensive analysis of evidence, and interviews with many witnesses. Brown and Davenport (2012:370) support the views of both James and Nordby (2005:180) and Bertino (2012:29) by indicating that reconstruction is the process of reproducing the actions and circumstances of a crime, based on examination and interpretation of evidence. According to Ogle (2012:5), crime scene reconstruction is based upon scientific methods. Ogle (2012:5) adds that the reconstruction of a crime scene is one of the major purposes of the collection of physical evidence. Additionally, the reconstruction of a crime scene may involve the reconstruction of a single event, such as determining a muzzle-to-target distance

in a shooting, or a sequence of events, such as the interpretation of bloodstain patterns at a crime scene.

Saferstein (2013:122) mentions that a critical phase of the investigation will be the preliminary reconstruction of events that preceded the onset of the incident. Reconstruction of the scene is accomplished by carefully noting where evidence is located in relationship to its known former position (Gilbert, 2010:81). According to Saferstein (2011:377), crime scene reconstruction is the method used to support a likely sequence of events at a crime scene, by observing and evaluating physical evidence and statements made by individuals involved with the incident. The physical evidence left at crime scenes plays a crucial role in reconstructing events that took place surrounding the crime. The collection and documentation of physical evidence is the foundation of a reconstruction (Saferstein, 2011:377). The reconstruction of the crime scene supports the likely sequence of events involved with the incident (Saferstein, 2011:376). Furthermore, Saferstein (2011:378) states that crime scene reconstruction relies on the combined efforts of medical examiners, criminalists and law enforcement personnel to recover physical evidence and sort out the events surrounding the occurrence of a crime.

To the question, "What is crime scene reconstruction?", the participants from Sample "A"answered as follows:

- The reconstructing of events that led to the crime (four (4) participants)
- Setting up of a mock crime scene exactly the same as it was left by the perpetrator (three (3) participants)
- An in-depth investigation of the crime scene to clarify points in dispute (one (1) participant)
- To establish how an incident occurred (one (1) participant)
- When the detective, witness and LCRC member go back to the crime scene to point out where the exhibits and victim weres found after a crime was committed (one (1) participant)

The participants from Sample "B"answered as follows:

- Determining the sequence of events that led to the crime (five (5) participants)
- Drawing a sketch and taking photographs of a witness pointing out places and positions of certain points of interest of a crime scene that was not initially processed by a CST (two (2) participants)
- Putting together the crime scene in its original form (one (1) participant)
- Re-enactment of the original crime scene (one (1) participant)
- When a crime scene is revisited to reconstruct the points where an incident took place (one (1) participant)

The researcher noted that none of the participants associated crime scene reconstruction with it being based on scientific methods, as stated by Ogle (2012:5). However, nine (9) participants from both samples did say that crime scene reconstruction involves forming a hypothesis of the sequence of events from before the crime was committed through its commission, as discussed by Bertino (2012:29) and confirmed by Brown and Davenport (2012:370). Three (3) participants from both samples said that it was a process of taking photographs and drawing sketches of points of interest of a crime scene, when the initial crime scene was not processed by a CST.

3.8 THE PURPOSE OF CRIME SCENE RECONSTRUCTION

James and Nordby (2005:180) clearly state that crime scene reconstruction involves scientific crime scene investigation, interpretation of patterned evidence at the scene, laboratory testing of the physical evidence, and a systematic study of related case information, in order to form a logical theory. This is, hence, not limited to crime scenes where a preliminary investigation was not conducted, but applies to all crime scenes – documented or not. Hueske (2006:9) states that the goal of crime scene reconstruction in general is to answer *who*, *what*, *when*, *how* and *why* questions. Jackson and Jackson (2011:6) suggest that the partial or complete reconstruction of a crime may be very important in corroborating or refuting an account of events given by suspects and eyewitnesses. Ogle (2004:251) comments that crime scene reconstruction often provides the investigator with the ability to determine which versions of the events at a crime scene received from individuals at the scene are correct, and which are

false. Ogle (2004:251) adds that the elements of the crime can frequently be established through a reconstruction of the events at the crime scene, and that crime scene investigation can determine whether the death is a result of suicide, accident or murder.

When asked the question, "What is the purpose of crime scene reconstruction?", the participants from Sample "A"answered as follows:

- To create a picture for the court to see what transpired, in order to give them a better understanding of what happened (four (4) participants)
- To clarify issues in dispute to determine who is telling the truth and who is lying (three (3) participants)
- To recreate the chain of events that led to the crime scene (two (2) participants)
- To obtain a clearer understanding of the crime scene (one (1) participant)

The participants from Sample "B" answered as follows:

- Help identify points of interest if the initial crime scene was cleaned up prior to being processed by a CST (two (2) participants)
- Recreate the events leading up to the crime for court purposes (two (2) participants)
- Identify and indicate relevant points on a crime scene (two (2) participants)
- Determine the sequence of events of a specific crime (one (1) participant)
- Establish and obtain a better understanding of what happened on a crime scene (one (1) participant)
- Identify disputes and resolve conflicts that arise from the crime scene (one (1) participant)
- Use facts and witnesses' accounts of events to determine what happened (one (1) participant)

The participants from both samples "A" and "B" were not very clear on the purpose of crime scene reconstruction. Three (3) participants from Sample "A" shared the same view as Ogle (2004:251), who stated that crime scene reconstruction often provides the investigator with the ability to determine which versions of the events at a crime scene, received from

individuals at the scene, are correct, and which are false. The remaining participants from both samples were not specific, but associated the purpose of crime scene reconstruction to be recreating events that led to crime, for court purposes, and to answer those *who, what, when, how* and *why* questions, as stipulated by Hueske (2006:9), while the other participants associated the purpose of crime scene reconstruction with an attempt to determine points of interest in crime scenes that were not documented at all.

3.9 THE USE OF FORENSIC PHOTOGRAPHY TO RECONSTRUCT MURDER CRIME SCENES

Ogle (2004:256) states that crime scene reconstruction is based on physical evidence such as bloodstain pattern evidence, firearm evidence and other types of physical evidence. For the purpose of this research the researcher will only look at aspects in which forensic photography is used in the reconstruction process of murder crime scenes, and not on any other processes involved in the reconstruction process – for example, bloodstain patterns and firearm evidence.

3.9.1 Bloodstain patterns

Gardner and Bevel (2009:107) define bloodstain pattern analysis as in-depth evaluation of the physical bloodstains at the scene and on associated objects. James and Nordby (2009:188) state that photographs are used to document and capture bloodstain patterns found on crime scenes. James and Nordby (2009:188) are supported by Orthmann and Hess (2013:51), who maintain that close-up photographs must be taken of bloodstains. These photographs are then used to conduct bloodstain pattern analysis, and determine which bloodstain pattern was present on the crime scene. Ogle (2004:265), James and Nordby (2009:249) and Orthmann and Hess (2013:156) agrees that bloodstains not visible to the eye, and treated with luminol and Bluestar, must be photographed in order to determine the bloodspatter pattern.

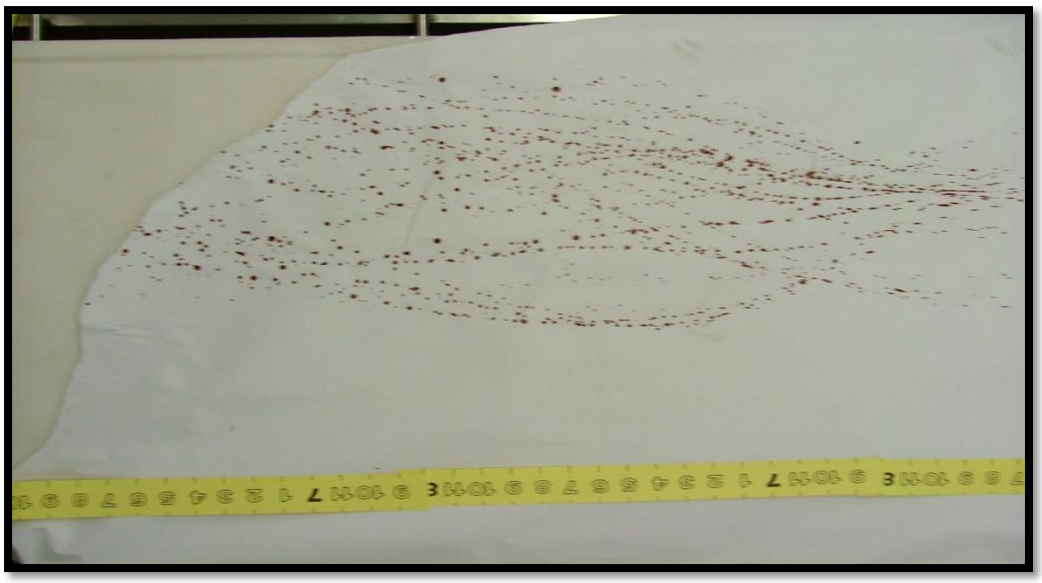

Figure 3.4: Is an example of blood splatter found on a crime scene that is photographed using a known measuring unit. (Source: Reproduced by Durban LCRC with permission from KZN: CR & CSM, as per attached Annexure "E")

3.9.2 Firearm evidence

Ogle (2004:256) stated that most reconstructions based on firearm evidence involve murders, and that the firearm evidence in reconstructions includes discharge residues, trajectories, weapon functionality, and locations of expended cartridges. Gardner and Bevel (2009:161) inform that lasers are often used in place of trajectory rods: the laser line is aligned with multiple defects, and then photographed.

Figure 3.5 (Source: Gillman & Collman, 2015)

In **Figure 3.5** above investigators used red and green lasers to map out every single bullet James Holmes fired in the Colorado movie theatre on 20 July 2012, killing 12 and injuring more than 70 people.

When asked the question, "How is forensic photography used when conducting murder scene reconstructions?", the participants from Sample "A" responded as follows:

- It provides pictures on the exact location of exhibits and victim (five (5) participants)
- It shows the place, position and measurements between exhibits and victims in correlation to the crime scene (two (2) participants)
- Two (2) participants were unsure, and could not provide an answer to the question.
- It allowed for blood spatter analysis to be conducted (one (1) participant)

The participants from Sample "B" responded as follows:

- Provides the exact location and position of exhibits (three (3) participants)
- Used to photograph bloodstains developed using luminol and Bluestar on crime scenes that were cleaned up and restored to its original condition (three (3) participants)
- Provides pictures for court purposes of witnesses indicating certain points of interest (two (2) participants)
- Is the best method to document the crime scene reconstruction process (one (1) participant)
- It provides a visual picture of the crime scene as it was found (one (1) participant)

Most of the participants from both samples related their answers to crime scene photography, in that, as stated earlier by Fisher (2004:79), forensic photography entails the recording and documenting of items of physical evidence found at the crime scene. Miller and Massey (2016:49) state that crime scene photography is an activity that records the initial appearance of the crime scene and physical evidence, in order to provide a permanent record for the courts. Only three (3) participants from Sample "B" related their answers to the reconstruction process and the use of photography to document bloodstains developed using luminol and Bluestar, as described by Ogle (2004:265), James and Nordby (2009:249) and

Orthmann and Hess (2013:156). None of the participants were ballistic experts, and this could be the reason for not mentioning photography as a means to document trajectory. Another point of interest is that none of the participants mentioned the use of aerial and 3D photography to reconstruct crime scenes, as discussed earlier in this chapter.

3.10 POST-MORTEM EXAMINATION PHOTOGRAPHY

Post-mortems in South Africa are conducted by pathologists employed by the state. Additionally, the forensic pathology services and all mortuaries in South Africa fall under the control of the Department of Health (Western Cape Government, 2017). Further, the pathologist, assisted by a forensic pathology officer, examines deceased individuals to accurately establish their identity, as well as the day and cause of death. The body of the deceased is considered to be a crime scene that they, as medical detectives, process, in order to find and preserve evidence to present in future court evidence (Western Cape Government, 2017). The SAPS policy on crime scene management (South Africa, 2009a:53) and the Western Cape Government (2017) both inform that the CST must attend and photograph the post-mortem, and decide which control specimens will be needed.

Ogle (2004:238) stated that photography is a critical aspect of the forensic autopsy. Ogle (2004:238), supported by Orthmann and Hess (2013:279), suggest that photographs be taken of the victim before the collection of the victim's clothing and of any trace evidence that may be altered by the procedure. Ogle (2004:238) adds that general photographs must be taken of the appearance and condition of the victim's clothing, as well as that of the entire body after the clothing has been removed. Ogle (2004:238) and Orthmann and Hess (2013:279) state that close-up photographs must be taken, with and without measuring units, of any marks, cuts, wounds, bruises or unusual conditions. Ogle (2004:240) added that any trace evidence must be photographed in detail, packed, and sent for analysis. An example of such would be a bullet head found in the body of a gunshot victim.

Figure: 3.6

Figure: 3.7

Figure: 3.8

In **Figures 3.6. 3.7** and **3.8** above the clothing of a murder victim is photographed during the post-mortem examination. (Source: Reproduced by Durban LCRC with permission from KZN: CR & CSM, as per attached Annexure "E")

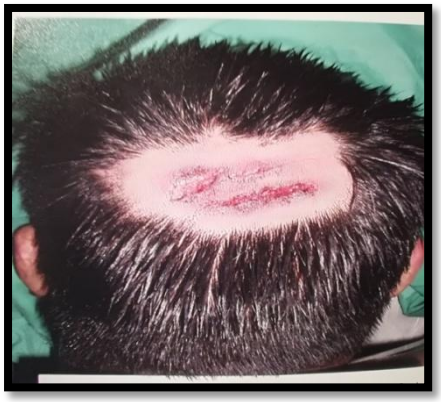

Figure: 3.9 (Source: Orthmann & Hess, 2013:282).

In **Figure 3.9** above lacerations caused by blunt force trauma on the head of a murder victim are photographed. During the post-morten examination the hair was shaven to ascertain the nature of the injuries. The researcher is of the view that such photographs must be taken with and without measuring units. The use of a measuring unit will allow for the size (length) of the wound to be clearly indicated.

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When asked the question, "How does photographing the post-mortem assist in the reconstruction stage?", the participants from Sample "A" responded as follows:

- Assists in obtaining a better understanding of the injuries and wounds and how they could have been sustained (three (3) participants)
- Assists in identifying and documenting the injuries sustained by the victim (two (2) participants)
- Shows the actual size of the wound(s) (one (1) participant)
- Shows the seriousness of the injuries (one (1) participant)
- Determines the nature of the wounds, post-mortem lividity, entry and exit wounds and possibly the weapon used (one (1) participant)
- Assists in determining the place and position of the wounds on the body, as well as the depth and size of wounds, as well as tool marks and the weapon used (one (1) participant)

The participants from Sample "B"answered as follows:

- Determine the cause of death and injuries sustained by the victim (five (5) participants)
- Identify the cause of death, wounds, defensive wounds, cause of death and entry and exit wounds (one (1) participant)
- Determine the cause of death, time of death and injuries (one (1) participant)
- Document the wounds on the victim (one (1) participant)
- Determine if the injuries on the deceased correspond with the crime committed (one (1) participant)
- Determine the cause of death, document the injuries sustained by the victim and the condition and appearance of the victims clothing (one (1) participant)

All twenty (20) participants from both samples “A” and “B” associated photographing the post-mortem with determining the cause of death and the nature of the injuries, as stated by Ogle (2004:238) and Orthmann and Hess (2013:279). The researcher noted that none of the twenty (20) participants mentioned the photographing and collection of trace evidence found on the victim, as discussed by Ogle (2004:240). The reason for this may be that the participants relied on the state pathologists to ensure that all trace evidence is collected from the victim during the poet-mortem examination. Orthmann and Hess (2013:280) state that the angle of the trajectory can be determined from the bullet's path through the body. Orthmann and Hess (2013:281) add that the bullet's path or angle determines the angle at which the weapon was fired, and the suspect's possible location at the time of firing. The researcher considers it important to note that none of the twenty participants mentioned determining and photographing the bullet's trajectory from its path of the bullet through the body, as this is vitally important when reconstructing the crime scene to determine the suspect's possible location and height.

3.11 STANDARD OPERATING PROCEDURES TO PHOTOGRAPH PHYSICAL EVIDENCE FOUND ON A CRIME SCENE

Wiid (2016:55) states that blood spatter patterns of any kind provide important information about the events that took place at a crime scene. James and Nordby (2009:226) maintain that the photographer must ensure that an overall photograph is taken of the crime scene, and that photographs must be taken of each drop and pattern individually, and, as a group, per pattern, with close-up photographs and medium-ranged photographs. These photographs point out specific stains used in determining the direction of force, angle of impact, and area of origin (Saferstein, 2011:396, 400).

Wiid (2016:57) highlights that in her research she found that from the docket analysis and interviewing of participants in her samples, photographers from the LCRC were the only persons used to document the crime scene. James and Nordby (2005:175) mention three (3) levels of photography, namely overall photographs, midrange photographs and close-up photographs.

James and Nordby (2005:175) further explain that overall photographs include surroundings, buildings, major structures, roads, path of travel, street signs, address numbers, doors leading into and from structures taking overlapping views. Midrange photographs follow a stepwise progression of views, and focus on individual items of evidence within the original view of the crime scene. Close-up photographs include the use of placards, and must be taken with and without scales. James and Nordby (2009:227) state that overall, midrange and close-up photographs must be used when documenting bloodstain patterns, and that documentation must be completed in such a manner that photographs, notes and diagrams can be used by a third party to place the bloodstain patterns and articles of evidence back in their original locations. Ogle (2004:263), supported by James and Nordby (2009:226) stated that the close-up photographs must have markers and measuring units within the photograph, in order to provide measurement data for the patterns.

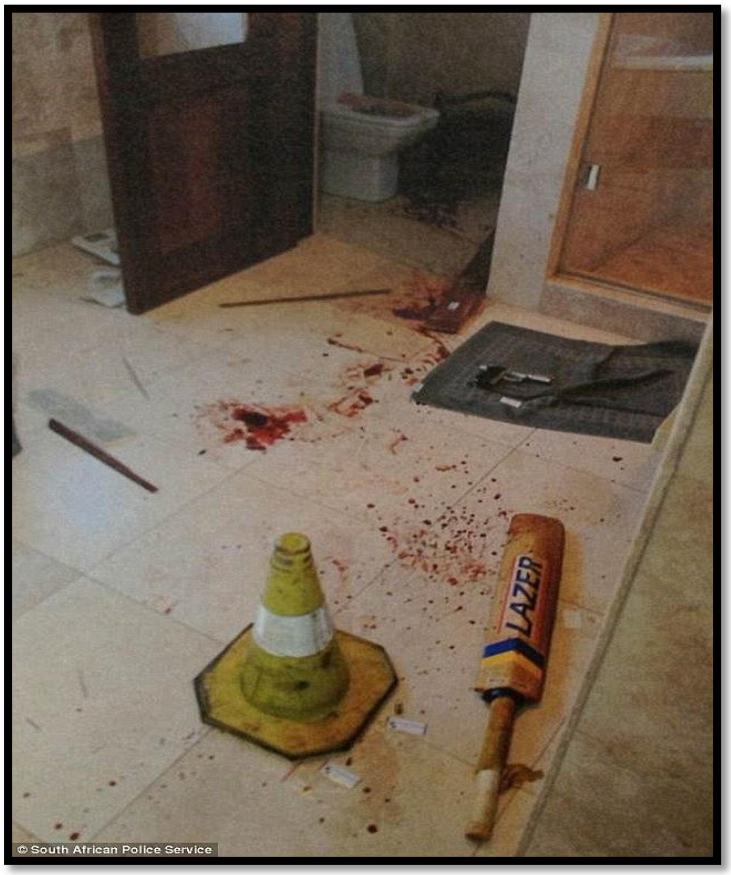

Figure 3.10: This mid-range photograph shows the blood-soaked bathroom where Oscar Pistorius shot his girlfriend Reeva Steenkamp in the toilet cubicle (top) with his 9mm pistol (seen lying on a bathmat, right) and the blood-splattered cricket bat (bottom right) he used to break down the toilet door after killing her. (Source: Hall, 2015)

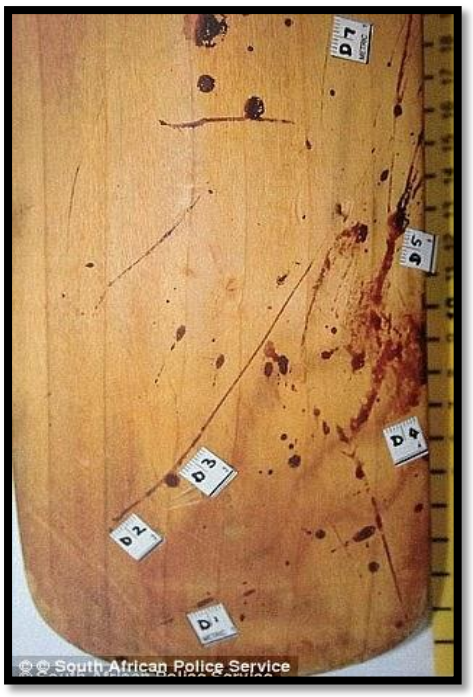

Figure 3.11: Indicates a close-up photograph of the cricket bat that Oscar Pistorious used to break down the bathroom door. (Source: Hall, 2015)

From the illustrations shown above, it is evident that the CST that attended the crime scene where Oscar Pistorious killed Reeeva Steenkamp followed the standard operating procedures as the photographs illustrated here clearly indicate that the bloodstains were photographed using measuring units. Mid-range and close up photographs of all exhibits were taken whilst processing the crime scene. This allowed for blood pattern analysis to be carried out at a later stage of the investigation

When asked the question, "What are the standard operating procedures to photograph physical evidence found on a murder scene, whereby the crime scene photographs serve as the primary only source of information available in the reconstruction process?", the participants from Sample "A" responded as follows:

- Three (3) participants stated that they were unclear on the standard operating procedures, and could not provide an answer to this question.
- Three (3) participants said that measuring units and measurements from one point to the next must be used when photographing bloodstains.

- Two (2) participants said that one must not tamper with or contaminate the exhibits.
- One (1) participant said that it is dealt with by the FSL and LCRC, and it is their responsibility to preserve such evidence.
- One (1) participant said that he was not sure, and that experts normally deal with this.

The participants from Sample "B" said that the standard operating procedures to photograph physical evidence found on a murder scene, whereby the crime scene photographs serve as the primary only source of information available in the reconstruction process, is to do the following:

- Use measuring units and measurement from one point to the next (three (3) participants)
- Take overall photographs, midrange photographs and close-ups using measuring units so that the photographs can be used for further analysis (two (2) participants)
- Take photographs of the entire crime scene and surrounding area (one (1) participant)
- Take photographs of all exhibits collected and taken away from the crime scene (one (1) participant)
- Ensure that the photographs show distances, heights and surrounding areas (one (1) participant)
- Use fixed points (one (1) participant)
- Use measuring tools and link one exhibit to the next (one (1) participant)

James and Nordby (2009:182-183) state that additional collection of data is based on the examination of physical evidence to continue the investigation. Scene examination and inspection of the physical evidence must be done, as interpreting bloodstain spatter, gunshot residue patterns and fingerprint evidence will lead to the formulation of a reconstruction hypothesis. None of the twenty (20) participants mentioned photographing fingerprints found on the crime scene for reconstruction purposes. This is supported by James and Nordby (2009:371), who suggest that, at times, a developed print must be carefully photographed, because the photograph will be the only permanent record of the evidentiary print.

Another point of interest is that only eight (8) of the twenty (20) participants made reference to taking photographs with a measuring unit or scale. James and Nordby (2009:203) explain

the importance of using a scale, and state that a scale is a small ruler, usually six (6) inches in length. James and Nordby (2009:203) add that a scale is used to "size" items in the photo image; for example if one photo-images bloodstains and fingerprints without placing a scale in the image, one has no way of reproducing the image of the fingerprint of bloodstain to the original size as found on the crime scene. The same applies for a bite marks and shoe prints. If, for example, a shoe print is photographed without a scale in the photo image, then there is no way of knowing whether the shoe is a size 5 or size 10. As illustrated in **Figure 3.2** below by using the scale of the ruler, this type of photograph can be enlarged to a natural size and then compared with a suspect's shoe.

Figure 3.12: Illustrates the photograph of a shoe print with a ruler placed alongside the impression. (Source: James, Norby and Bell, 2014:391).

3.12 IMPROVEMENTS TO ENHANCE MURDER SCENE RECONSTRUCTIONS

As stated earlier in the problem statement, the researcher found that the only time a reconstruction of crime occurs is when the initial scene was not attended to by a forensic fieldworker and the crime scene was not documented at all. The CST, SAPS detective and witness visit the crime scene, and points of interest are indicated by either the SAPS detective or the witness. The CST takes some photographs of the place and area in which the crime occurred, and refers to this as a crime scene reconstruction.

Forensic methods and techniques that require the use of forensic photography to enhance the way in which crime scene reconstructions are currently conducted, include the following:

3.12.1 Luminol

James and Nordby (2009:267) indicate that often the presence of blood is suspected, based on witness information, or expected in a particular location, but, under normal lighting and viewing, little is to be seen. James and Nordby (2009:267), Ogle (2004:42), Yacine and Fellag (2012:11) and Orthmann and Hess (2013:155) inform that luminol causes blood to fluoresce a pale blue colour, and can detect blood that has been diluted as much as 10 000 times. Orthmann and Hess (2013:155) add that luminol does not harm DNA in blood, and allows the blood to be collected for further analysis.

Ogle (2004:42) and Yacine and Fellag (2012:112) state that the area treated with luminol must be photographed in order to have graphic evidence of the test results, and, if positive, to document the bloodstains, so that they can be analysed at a later stage. Orthmann and Hess (2013:156) state that bloodstains and splatter patterns are useful evidence, because they are characteristics of certain physical forces and can help investigators determine how a criminal event played out. With a sufficient quantity of bloodstain evidence at a crime scene, investigators can determine the location of people or objects at a crime scene, the movement of people or objects within the crime scene, areas of origin of bloodshed, type(s) of weapon(s) used and force levels involved, the minimum number of blows, shots or events, and, whether the suspect may have been injured.

3.12.2 Bluestar

James and Nordby (2009:269) state that a new variation of luminol has become available, in the form of Bluestar. In the SAPS, CST'S from the LCRC are trained in the use of Bluestar and have its use at their disposal. The SAPS module on forensic biology (South Africa, 2009b:30) states that in some cases it is impossible to determine whether possible blood was washed from surfaces on the crime scene. Bluestar is a popular blood enhancement reagent used to detect latent bloodstains, and a positive result can be seen by chemiluminescence, and then photographed.

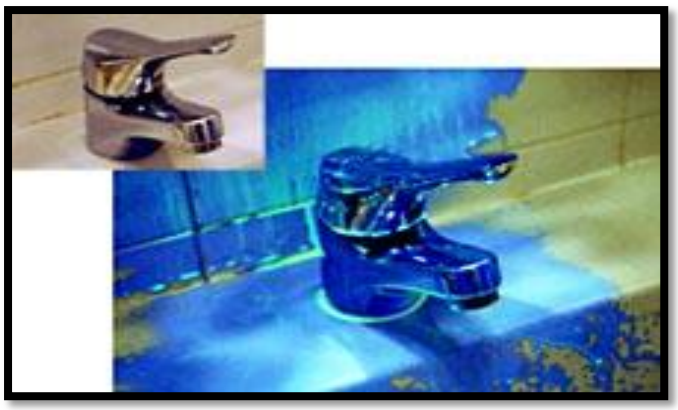

Figure 3.13: Illustrates the effect of blue star on blood that is not visible to the naked eye. Once the area is sprayed with bluestar, the area containing blood will be revealed with a chemiluminescence. (Source: Bluestar Forensic, 2004).

3.12.3 Photogrammetry

Gardner and Bevel (2009:258) state that photogrammetry is the process of making precise measurements by means of photography. The simplest method is to use a known scale in the image, such as a scale next to a bloodstain. Photogrammetry can be used to create three-dimensional virtual models, and the end product must depict the evidence and assist the blood spatter expert in explaining the evidence.

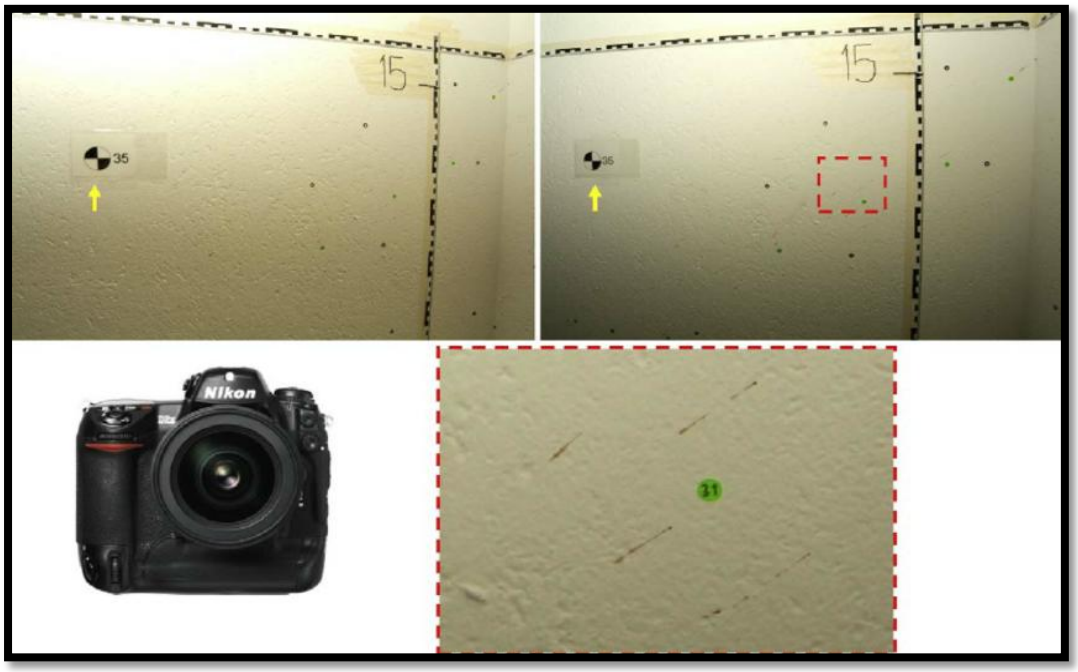

Figure: 3.14 (Source: Buck, Kneubuehl, Nather, Albertini, Schmidt and Thali, 2010:23)

Figure 3.14 above depicts a photogrammetric documentation of the bloodstain pattern, using a digital single-lens reflex camera. Reference points are stuck on the wall to support the fusion of the photogrammetric analysis with the tachymetry or laser scanning measurements (yellow arrows). One photogrammetric image pair consists of two images taken from the left and the right-side of the same part of the object. A blown up detail of the right image (red rectangle) shows well-defined bloodstains

3.12.4 Three-Dimension Imaging

Gardner and Bevel (2009:260) state that more effective movie-like files are made from the products of 3D laser scanners. 3D laser scanners represent the actual points in the scene, and provide an accurate virtual tour of the scene. Since 3D scanners capture a 360° view of the crime scene, all areas of the scene that were visible to the camera will be depicted.

3.12.5 Animation

Gardner and Bevel (2009:258) further state that software programmes such as 'PhotoModele' and 'iWitness Import images' produce realistic models that can be used in animation. Gardner and Bevel (2009:261) add that animation figures are used in combination with crime scene images. Crime scene images are imported in the animation programme to illustrate specific scene information.

When asked the question, "What improvements can be made to enhance the results of murder scene reconstructions in the way in which they are currently conducted?", the participants from Sample "A" responded as follows:

- Three (3) participants were not sure and could not provide an answer to this question.
- Two (2) participants said that the LCRC must have crime scene reconstruction specialists and use specialised equipment for reconstruction purposes.
- One (1) participant said that the SAPS must provide training and information on the crime scene reconstruction process to detectives.
- One (1) participant said that the FSL must provide the analysis reports timeously for the exhibits that were collected on the crime scene.

- One (1) participant said LCRC members must spend more time on the crime scenes and take more photographs.
- One (1) participant said that 3D images must be taken of the crime scene.

The participants from Sample “B” responded as follows:

- Four (4) participants did not see any way in which the current crime scene reconstruction process can be improved.
- One (1) participant said that LCRC members must spend more time on the crime scene and take more photographs.
- One (1) participant said that LCRC members must take as many pictures as possible.
- One (1) participant said that LCRC members must use the spheron camera to take 3D images that can be used to reconstruct the crime scene.
- One (1) participant said that LCRC members must put in more effort when conducting crime scene reconstructions.
- One (1) participant said that new technology; training and specialised equipment is required to create three-dimensional animated reconstructions.
- One (1) participant said that ballistic and blood spatter experts must be utilised to conduct crime scene reconstruction.

The use of 3D photography and animation was mentioned by some of the participants from both samples, and seems to be the future of crime scene reconstruction in South Africa, as it is currently in use by first world coutries such as the United States of America, as stated in Gardner and Bevel (2009:258, 260). Although participants from both samples seem content with the current method in which reconstructions are currently conducted, the researcher alludes to the fact that more needs to be done by our CST’S when reconstructing not only murder crime scenes, but any crime scene for that matter.

3.13 SUMMARY

This chapter explored a clear understanding of forensic photography and crime scene reconstruction. The different types of forensic photography, as well as the role of forensic photography in crime scene reconstruction, were also discussed. Forensic photography is one of the most used disciplines in forensic science, and is used to document crime scenes from the time they are reported, throughout the further investigation stages. From the above discussions, it has become evident that forensic photography plays a vital role in documenting the crime scene and keeping a permanent record of the scene. The participants from both samples provided some valuable information on forensic photography and crime scene reconstruction, and the researcher has identified some new possibilities that can be used when reconstructing future murder crime scenes. The findings and recommendations of this research will be discussed in the next chapter.

CHAPTER FOUR
DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

4.1 INTRODUCTION

The success or failure of any criminal investigation often depends on the recognition of physical evidence left at a crime scene, and the proper analysis of that evidence. This research was prompted to determine whether a review of the notes, diagrams, photographs, videos and conclusions from the initial crime scene allowed for CST'S and SAPS detectives to reconstruct the same crime scene at a later stage. Collaborating evidence and findings during the preliminary investigation will assist in determining whether the facts found at the initial crime scene support the conclusions being drawn at the end of the reconstruction stage. This is done by reconstructing the chain of events that led to the crime, and placing evidence found in the preliminary investigation in the context of the crime.

The process of conducting crime scene reconstructions in the eThekwini Central area consisted of taking photographs of the place(s) where crime or an incident occurred, and this was referred to as a crime scene reconstruction by both the SAPS detectives and CST'S. In the researcher's opinion, the CST'S from Durban LCRC were not using the fundamentals of forensic science to conduct crime scene reconstructions; therefore, this research aimed to determine the value of photography as part of forensic science, to reconstruct murder crime scenes.

In this research, the research aim was to determine the value of photographs as a technique used in the forensic science discipline to reconstruct the crime scene and to assist the court during the litigation process to have a visual presentation of the crime scene to reach the correct decision. In order to achieve the aim of this research, the following research questions were asked:

- What is the role of forensic science (forensic photography) in criminal investigations?
- How can photography, as part of forensic science, be used in the reconstruction of murder crime scenes?

In this chapter the findings of this research will be discussed from the information obtained in the interview sessions held with the participants in this study, as well as the information obtained from the documentary sources. These findings relate to the research problem, research aim and research questions. Each finding will be followed by recommendations made by the researcher. This chapter will conclude by the researcher providing an overview of the entire research.

4.2 DISCUSSIONS AND FINDINGS RELATED TO RESEARCH QUESTION 1

During this research study, the researcher has made the following findings regarding Research Question 1,"What is the role of forensic science (forensic photography) in criminal investigation? "These findings are based on the literature and the interviews conducted with participants from samples “A” and “B”.

4.2.1 Criminal investigations

In terms of Section 205 (3) of the Constitution (South Africa, 1996), one of the objectives of the SAPS is to prevent, combat and investigate crime. From the literature, it was found that criminal investigation is a logical, objective, legal inquiry involving a possible criminal activity (Gilbert, 2010:37-38). Criminal investigation also entails reporting the incident, investigating the crime scene and collecting physical evidence, identifying and arresting the perpetrator, recovering stolen property, as well as proving the guilt of the accused in court. From the literature and twenty (20) participants from both samples “A” and “B”, it was found that criminal investigation is a systematic search for the truth, through the process of investigating and making enquiries about the crime that was committed. The SAPS detectives and the CST’S are aware of the fact that criminal investigations are sought to uncover the truth, collect physical evidence and identify the perpertrator. In this research the researcher has found that criminal investigation is sought to collect physical evidence used to prosecute a perpertrator in murder cases. The more evidence found against the accused the stronger the case becomes for the state and the chances of successful prosecution become stronger. The researcher also found that higher quality criminal investigations will lead to a higher conviction rate of perpertrators commiting serious and violent crimes such as murders. This is

done by ensuring that the courts make the right decision by having a visual presentation of the crime scene reaching the court room.

4.2.2 The objectives and purpose of criminal investigations

From the literature, and the twenty (20) participants from both samples "A" and "B", there was a close relationship, and some confusion, on the objectives and purpose of criminal investigation. Some of the literature, and all twenty (20) participants from both samples, closely associated the purpose of criminal investigation with that of the objectives of criminal investigation. Although no single participant mentioned all the objectives of criminal investigation, it was found that from the literature and all twenty (20) participants' viewpoints put together, the objectives of criminal investigation involve identification of the crime, gathering of evidence, individualisation of the crime, arresting the criminal, recovery of stolen property, and involvement in the prosecution process (Van der Westhuizen (1996:4-7). Fisher (2004:48), Gardner (2005:2), Lyman (2011:15) and Orthmann and Hess (2013:11) concur with Van der Westhuizen (1996:4-7). It was found that the main purpose of criminal investigation is to prevent crime (Hess *et al*., 2016:2). From the interviews with the participants it was evident and a matter of concern that not one of the participants mention the recovery of stolen property as as an objective of criminal investigation. The finding in this research is that although an objective of criminal investigation can be achieved alone, it is of utmost importance that all objectives of criminal investigation be achieved together in order to ensure the successful prosection of the accused.

4.2.3 The role of forensic science in criminal investigations

It was found that professionals who work in the field of biology, anthropology, entomology, odontology, pathology, metallurgy and other related fields, and who use their skills to help law enforcement officials to conduct their investigations, fall under the umbrella of forensic science (Saferstein, 2011:4). It was also found that forensic photography is a discipline that falls under forensic science (Orthmann & Hess, 2013:8). From the literature, it was found that 'forensic' refers to a science which is applied in criminal investigations that can be used for court purposes. From the literature, Horswell (2004:4) and the participants from both samples "A" and "B", it was found that forensic science deals with laboratory analysis of physical evidence collected on a crime scene. Through this research it was found that SAPS detectives

and CST'S utilise forensic science on a daily basis throughout the nature of their duties. From attending cime scenes, collecting physical evidence, documenting crime scenes using sketches and photographs all entail the use of forensic science. The use of forensic science increases the chances of identifying a perpertrator and linking a perpertrator to a specific crime scene. Forensic science has now become a fundamental pre-requisite in conducting effective criminal investigations. In this research, it was found that whilst addressing the aim of the research forensic science is used on a daily basis by CST'S by taking photographs of crime scenes in order to provide the courts with a visual presentation of the crime scene.

4.3 DISCUSSIONS AND FINDINGS RELATED TO RESEARCH QUESTION 2

During this research study, the researcher has made the following findings regarding Research Question 2, "How can photography, as part of forensic science, be used in the reconstruction of murder crime scenes?" These findings are based on the literature and the interviews conducted with the twenty (20) participants from both samples "A" and "B".

4.3.1 The use of forensic photography in reconstructing a murder crime scene

It was found that forensic photography entails the recording and documenting of items of physical evidence found at the crime scene, using a camera, in the same setting or conditions in which they were found by the investigator (Fisher, 2004:79). It was also found that crime scene photography is an activity that records the initial appearance of the crime scene and physical evidence, in order to provide a permanent record for the courts (Miller & Massey, 2016:49). From the literature, and five (5) participants from Sample "B", it was further found that forensic photography, over and above being used to document crime scenes, was also being used to photograph wounds, bitemarks, weapons, suspects, post-mortem procedures and crime scene reconstructions. Emanating from this research including the literature, seven (7) participants from Sample "A" and all ten (10) participants from Sample "B", it was found that the different types of forensic photography include aerial photography, laboratory photography, UV photography and 3-D photography. The findings of this research are evident that more can be done to capture the true essence of the crime scene. With the availability of three dimensional photography and sphreon cameras, documenting crime scenes offer the CST more options rather than just using a single reflex digital camera. Times

have evolved and so should the mindsets of CST'S. Technological advancements in the photography of crime scenes by means of three dimensional cameras and scanners are available resources to be used by the modern day CST''S and should be utilised on a daily basis.

4.3.2 The crime scene reconstruction process

The researcher found that reconstructing murder crime scenes involves a scientific analysis of the crime scene and events, in a chronological manner, to link a detailed series of events to scientific explanations with the purpose of understanding and recreating the sequence of events leading to the crime. Crime scene reconstruction also serves a major purpose in the collection of physical evidence and placing such evidence in the context of the crime (Saferstein, 2011:377). This helps when identifying the position of a firearm found in relation to the victim, place and position of defensive wounds or fingerprints found on the body of a victim.

The researcher found that crime scene reconstruction not only focuses on the incident itself, but also on the events leading up to the incident. Crime scene reconstruction will support the sequence of events and the physical evidence found at the crime scene. It was also found that crime scene investigation relies on combined efforts by various departments within and out of the SAPS – for example, Air Wing, to cater for CST'S to take aerial photographs, FSL to analyse physical evidence found at the crime scene, and pathologists who are employed by the Health Department who are responsible for conducting post-mortems. This is reiterated by (Saferstein, 2011:378), who informs that crime scene reconstruction also relies on combined efforts from medical examiners, criminalists and investigators, to recover the physical evidence and ensure that the events surrounding the crime are finalised. From the twenty (20) participants from both Samples "A" and "B", it was found that the only time a crime scene is reconstructed is when there was no preliminary investigation done because the crime scene was cleaned up without being processed by CST'S. The findings of this research differ from that of the participants and advise that a crime scene reconstruction can take place irrespective if a preliminary investigation was done or not. In actual fact, it proved to be better to reconstruct a crime scene whereby a preliminary investigation was done compared to that of where a preliminary investigation was not done. The reason for this is the fact that

the photographs and sketches taken during the preliminary investigation together with the physical evidence collected from the crime scene can be reviewed to recreate the sequence of events that led to the crime.

4.3.3 Improvements to enhance murder scene reconstructions

From the literature, it was found that, when conducting a crime scene reconstruction and it is suspected that the area where the crime occurred has been cleaned up then Bluestar and luminol can be used to detect traces of blood (Orthmann & Hess, 2013:155). Orthmann and Hess (2013:155) go on further to state that luminol causes blood to fluoresce a pale blue colour, and can detect blood that has been diluted as much as 10 000 times. It was found that all ten (10) participants from Sample ”A” do not know much about the crime scene reconstruction process, and rely on the CST’S to assist them in this field. From the literature and three (3) participants in Sample “B”, it was found that three-dimensional photography and animation can be used to conduct realistic, in-depth crime scene reconstructions. The findings in this research have revealed that the use of chemical reagents such as bluestar and luminol can assist in tracing and identifying blood that has been cleaned up and no longer visible to the naked eye. This is evident that SAPS detectives should never take things for granted and must allows request the services of a CST to to conduct eximinations for blood and other bodily fluids that are not visible to the naked eye. The findings have also revealed that photogammetry and animation software is not readily available for crime scene reconstruction purposes in South Africa as compared to that of the United States of America, for instance.

4.4 RECOMMENDATIONS EMANATING FROM THE FINDINGS OF RESEARCH QUESTION 1

4.4.1 Criminal investigations

Based on the findings of Research Question 1, it is recommended that members from detective services and the LCRC both attend annual refresher workshops outlining the basis of criminal investigation and what criminal investigation entails. This will allow for the SAPS detectives and CST’S to be aware of any amendments to the acts and legislation

regulating criminal law and forensic science in South Africa. Participants from both samples "A" and "B" who were representative of the SAPS detectives and the LCRC need to develop a working relationship with each other, as CST'S from the LCRC are an aid to the SAPS detective in assisting him/her in their investigation. A working relationship between the SAPS detectives and the CST will allow each party to understand the functions of each other on the crime scene. A working relationship between both parties will also result in a lesser waiting period for the crime scene to be attended by a CST, as both parties can communicate to each other telephonically. The new, younger detectives must work alongside more experienced detectives, as it will assist in increasing their level of learning, understanding and expertise. SAPS detectives need to adopt a mentor/mentee relationship throughout their careers as this will allow for a cross pollination of skills and experience in generations to follow.

4.4.2 The objectives and purpose of criminal investigations

In South Africa, once a police officer completes the Basic Police Development Learning Programme (BPDLP), the Basic Crime Investigation Practise (BCIP) course and the Resolving Of Crime (ROC) learnership, they are considered to be trained in the field of investigation and is considered to be a SAPS detective. From experience it was noticed that SAPS detectives then develop their own mindset on investigation and conduct their investigations in a way that personally suites them. It is therefore recommended, that annual workshops on the purpose and objectives of criminal investigation be held as this will allow for SAPS detectives to go back to basics and understand the objectives of criminal investigations. The objectives of criminal investigations are not only to arrest the suspect and bring them before the court, but also include recovering stolen property. Not one of the twenty (20) participants from both samples "A" and "B" mentioned recovering stolen property as an objective, which is a matter of concern.

Annual workshops on the objectives and purpose of criminal investigations will therefore remind SAPS detectives of their duties and functions as a SAPS detective. All twenty (20) participants from both samples "A" and "B" did not know that the main purpose of criminal investigations is to prevent crime. It is recommended that detectives hold more operations and conduct more patrols together with crime prevention units, in order to prevent crime.

SAPS detectives and crime prevention units need to work alongside each other in order to try and win the fight against crime. It is also recommended that SAPS detectives continually strive to obtain a conviction on their dockets with suspects, as convicting a suspect will prevent them from committing any further offences.

4.4.3 The role of forensic science in criminal investigations

The participants from Sample "A", the SAPS detectives, should receive more in-depth training in the field of forensics, not so much so as to become an expert in the field as are the LCRC members (Sample "B"), but enough to develop adequate knowledge in the fundamental uses of forensic science in criminal investigations. This will allow for SAPS detectives to understand the importance of safeguarding crime scenes and preventing contamination of crime scenes. This will also prevent the SAPS detective form making hasty decisions to clear up and hand back a crime scene before it is thoroughly examined and investigated by a CST. It is also recommended that detectives increase the utilisation and deployment of LCRC members on crime scenes, in order to effectively search for and collect relevant physical evidence that can assist in criminal investigations. The increased utilisation of CST'S on crime scenes will allow for better quality physical evidence to be collected from the crime scene as well as proper documentation of that crime scene. Recommendations are made for annual workshops to be held for SAPS detectives on the latest developments in forensic science, and duties of the FSL, as well as to provide information on when and how the FSL can assist detectives in their investigations, as this will allow the SAPS detective to be aware of the resources available to him/her whilst processing a crime scene.

4.5 RECOMMENDATIONS EMANATING FROM THE FINDINGS OF RESEARCH QUESTION 2

4.5.1 The use of forensic photography in reconstructing a murder crime scene

The researcher is of the same view as Wiid (2016:57), and states that since the LCRC members are the only persons used to document the crime scene, it is vitally important that correct photographs are taken of the crime scene ensuring that correct procedures are followed when documenting a crime scene and bloodstains found on the crime scene. In the

researcher's experience, once a CST leaves the crime scene and the area is handed back to the owner or public, the crime scene is no more. Bloodstains will be cleaned up and the bloodstain patterns will be lost forever; therefore, the photographs taken of bloodstain patterns in the preliminary investigation will serve as the only source of information available to be used in order to reconstruct the events that produced their pattern and sequence. These photographs are vitally important as they are then used at a later stage to conduct blood spatter analysis and reconstruct the crime scene for the court purposes. If the documenting of blood spatter patterns is not done properly, then a blood spatter analyst will not be able to analyse the blood spatter and ultimately the court will not understand what transpired at the crime scene.

It is therefore recommended that blood spatter patterns be photographed with and without measuring units, taking midrange and close up shots. It is also recommended that three-dimensional photographs, using a spheron 360° camera, be taken of all sensational serious and violent crime scenes. This will provide a holistic view of the crime scene. It is further recommended that all post-mortem examinations be photographed, in order to keep a record of the injuries that caused the death. This is vitally important when a victim is removed from a crime scene and dies in hospital. There are no crime scene photos, and no record of the injuries; therefore, photographing the post-mortem examination provides a picture of the victim, and close-up views of the injuries sustained by the victim. Lastly it is recommended that aerial photographs be taken when primary and secondary crime scenes are in close proximity to each other as this can show the relation to one another as well as the distances between the primary and secondary crime scene.

4.5.2 The crime scene reconstruction process

Considering the findings, the researcher recommends that SAPS detectives be made aware of, and informed, as to how crime scene reconstructions can assist them during the course of their investigations. SAPS detectives should utilise all resources available to them to understand what occurred at the crime scene and how it occurred. Crime scene reconstructions should be conducted for all crime scenes and not only crime scenes where no preliminary investigations of the initial crime scene were conducted. Reconstructing a crime scene will assist SAPS detectives in determining the possible sequence of events leading up

to the crime as well as distances between witnesses and the incident. The distance between the witnesses and the incident is vitally important in court proceedings as this will show the court the true distance of the witnesses in relation to the crime. This will be an advantage for the observations of the witness to be admissible in court proceedings. It is further recommended that crime scene reconstructions be done on all sensational serious and violent crimes – for example, political murders, farm murders, double murders and police killings. It is further recommended that crime scene reconstructions of this nature should be conducted irrespective of whether or not the initial crime scene was investigated by a CST. This will allow for a review of the photographs, notes, sketches and physical evidence collected during the preliminary investigation to be examined in order to dertime the sequence of events that lead to the crime.

4.5.3 Improvements to enhance crime scene reconstructions

The researcher states that more can be done to search for evidence that may have already been cleaned up, such as searching for blood using Bluestar, as stipulated in James and Nordby (2009:269) and the SAPS module on forensic biology (South Africa, 2009b:30). It is therefore recommended that CST'S from the LCRC make use of Bluestar to look for blood when attempting to reconstruct crime scenes that have been compromised. It is also recommended that each and every LCRC in the country have a team of experts specialising in crime scene reconstructions. In the same way that there are fingerprint experts, facial identification experts, and persons specialising in compiling identikits in the LCRC, there should also be crime scene reconstruction specialists within the LCRC. Having crime scene reconstruction specialists on a LCRC level, will allow these experts to be easily accessible to SAPS detectives across South Africa. It is further recommended that crime scene reconstructions be done using 3D photography, and, where possible, the SAPS need to match up to international standards such as that used in the United States of America and conduct crime scene reconstructions using photogammetry and animations. The reason for such a recommendation is that photogammetry and animation have the distinct advantage of producing three dimensional realistic models of the crime scene.

4.6 CONCLUSION

This research on the use of forensic science in crime scene reconstruction was limited to forensic photography. Forensic photography was then discussed as an investigative tool in the crime scene reconstruction process. It was found that forensic photography would assist SAPS detectives in documenting and reconstructing murder crime scenes. SAPS detectives, as well as the families of murder victims, will benefit from this, as crime scene reconstructions can now be seen in a different light. Also, the SAPS detectives' perception of crime scene reconstructions only being done when the initial crime scene was not processed needs to be changed. Any crime scene can be reconstructed to determine the sequence of events. Using forensic science and photographs to reconstruct murder crime scenes will allow the general community in South Africa to regain trust in the SAPS, as well as in the criminal justice system of South Africa, as harsher sentences will be imposed on the accused.

Having crime scene reconstruction specialists on a LCRC level will help SAPS detectives to ensure that all aspects of crime scene reconstruction are used to the fullest, and that all evidence is collected and presented before a court of law. SAPS detectives will clearly understand what criminal investigations entail, and what comprises the objectives of criminal investigations, as these aspects are clearly defined in this research.

SAPS detectives also need to understand the value of the CST'S available to them through the LCRC and the FSL. SAPS detectives should make use of CST'S to reconstruct murder (and other) crime scenes. Training workshops, lectures and refresher courses are highly recommended, but detectives knowing the importance of the Division: FSS, and utilising the LCRC on a daily basis to reconstruct the crime scenes, will ensure a better conviction rate in the courts of law in South Africa. This will prove beneficial, not only the SAPS, but also to the National Prosecuting Authority (NPA) and the general community of South Africa. In conclusion, the researcher alludes that the future of crime scene reconstructions in South Africa is pointing towards the direction of crime scenes being digitally reconstructed using Photogammetry and 3D animation software.

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ANNEXURE A

INFORMED CONSENT FORM QUALITATIVE DATA COLLECTION

Researcher: Mr S. Singh
South African Police Service

Supervisor: Mr RJ Mokwena
School of Criminal Justice, Unisa

Contact Person for research related inquiry: Mr RJ Mokwena

Dear research participants,

An evaluation of the role of forensic science in crime scene reconstruction

Thank you for your involvement in this research study. Please see the attached research proposal for more information regarding the study. It is deemed ethical practice to obtain informed consent from a research participant prior to the commencement of a research initative. Informed consent involves the following:

1. **Purpose of the study.** The present study is being undertaken for the fulfilment of a Masters of Arts: Criminal Justice in the subject FORENSIC INVESTIGATION at the University of South Africa (UNISA). To explore, describe and explain the role of forensic science in crime scene reconstructions and to better understand the role of forensic photography and measure the value of forensic photography in crime scene reconstructions is the means to formulate a proactive strategy.

2. **Procedures.** A semi-structured interview will be used in order to gain valuable

information from the participants. The interview will serve as a means to gain insight and knowledge from the participants' respective fields. The interview should not last longer than sixty (60) minutes and will be held according to the participants' convenience. The interview will be recorded by means of a tape recorder.

3. **Risks and discomfort.** There are no predetermined risks accompanying this study. The research participant is merely providing the researcher with his/her knowledge and experiences about the subject matter.

4. **Benefits.** There are no perceptible benefits or incentives available for the participants of this research. However, it can be proposed that the research participant will benefit in some way through the process of knowledge production.

5. **Participant's rights.** Participants are at liberty to withdraw from the study at any stage of the research, provided a courtesy notification of withdrawal is sent to the researcher. No negative repercussions will be enacted on the participant, as participation is voluntary, and all data received from the participant will be assumed void. The participant can withdraw at any time without an obligation to explain why the particiant chooses to withdraw from the study.

6. **Confidentiality.** All information will be regarded as personal and confidential. The researcher will not disclose the participants' names or contact details under any circumstances.

7. **Data storage and dissemination of findings.** The information received will be stored (password protected) by the researcher. The findings of the research will be documented in the form of an academic mini-dissertation.

8. **Ethical considerations.** The study was ethically constructed and approved by UNISA's Ethical Committee.

9. **Questions and concerns.** The researcher welcomes any questions or concerns regarding the research study.

10. **Researcher's Qualifications.** The researcher currently holds a Certificate in Anti-Corruption and Commercial Crime Investigation National Qualifications Framework (NQF) 6, a National Diploma in Policing (NQF 6), and a Baccalaureus Technologie (BTech) degree in Forensic Investigation (NQF 7). All qualifications were obtained through UNISA.

Please provide your initials and surname below:

I understand my rights as a research participant and voluntarily give my consent to participate.	
Research participant:	**Date:**
Researcher:	**Date:**

ANNEXURE B

INTERVIEW SCHEDULE – SAMPLE "A" – SAPS DETECTIVES FROM eTHEKWINI CENTRAL CLUSTER AND SAMPLE "B" - CRIME SCENE TECHNICIANS FROM DURBAN LCRC

TOPIC: AN EVALUATION OF THE ROLE OF FORENSIC SCIENCE IN CRIME SCENE RECONSTRUCTION

The researcher limited the research study in respect of forensic science to focus on how to use photography as part of forensic science to reconstruct a crime scene. As there are many sections in the Division: Forensic Science Services (FSS), the researcher will concentrate on how forensic photography may be of aid to another Division of FSS, but not on the contribution that may be made by any other Division of FSS.

Due to the financial implications, logistics, time constraints, and the fact that this research is a mini-dissertation it would have been impossible to interview all detectives from the thirty eight (38) different police stations under the Durban Local Criminal Record Centre (LCRC) in Kwa-Zulu Natal (KZN) or the Crime Scene Technicians (CST'S) from the eight (8) different LCRC's in KZN. Therefore, the researcher has limited this study to a sample of SAPS detectives based in the Durban geographical area, namely Durban Central SAPS, Berea SAPS, Sydenham SAPS, Point SAPS, Mayville SAPS, Cato Manor SAPS that form the eThekwini Central Cluster as well as the CST'S from Durban LCRC.

The researcher limited this study to SAPS detectives and CST'S working in the public sector and based in the Durban geographical area, as this is where the researcher works and is based. The focus of this research will be on how to use photography as part of forensic science in the reconstruction of a crime scene and not on any contribution that could be made by any other Division of FSS, therefore the researcher must determine whether SAPS detectives are utilising forensic services to conduct crime scene reconstructions and whether the investigators are utilising the services of the LCRC's to conduct proper and complete crime scene reconstructions, irrespective if a preliminary investigation had been done. By using the

qualitative research approach, the researcher intends to obtain first hand information from the participants by means of an interview. It will enable the researcher to have insight into their real-life experiences and practical knowledge of the research topic.

In this research, the research aim is to determine the value of photographs as a technique used in the forensic science discipline to reconstruct the crime scene and to assist the court during the litigation process to have a visual presentation of the crime scene to reach the correct decision. In order to achieve the aim of this research, the following research questions will be asked during the interviews:

- What is the role of forensic science (forensic photography) in criminal investigations?
- How can photography, as part of forensic science, be used in the reconstruction of murder crime scenes?

IMPORTANT INFORMATION FOR PARTICIPANTS

You are kindly requested to answer the following questions in this interview schedule, for the researcher. The questions, responses and the results will be revealed. The researcher is bound to his assurances and guarantees by the ethics code for research of the University of South Africa (UNISA). The information you provide will be used in a research project for a Master of Technology degree registered with the Programme Group: Police Practice at the UNISA. The analysed and processed data will be published in a research report.

Your answers will be noted by the interviewer himself, on a tape recorder. Should any question be unclear, please ask the researcher for clarification. Only one (1) answer per question is required. When answering the questions, it is very important to give your own opinion.

Written permission has been obtained from the South African Police Service (SAPS) in advance, for the interview to be conducted. Permission from the participants also needs to be obtained in order for the interview process to continue. Please complete the undertaking below in order to be a part of this research.

THANK YOU for your time and effort for being a part of this research.

I, the participant (rank) _____ (name) _____ with persal no. _____ hereby give permission to be interviewed, and the information I supply may be used in the research. My identity will be kept confidential and I will be known as Participant ____ in the study.

_____ _____

Signature (Participant) Signature (Researcher)

SECTION A: HISTORICAL INFORMATION

1. What rank do you hold in the South African Police Service (SAPS)?
2. How many years of experience do you have in the service?
3. Are you a SAPS detective/crime scene technician (CST)?
4. How many years of experience do you have as a SAPS detective/CST?
5. What training courses have you completed in the detective environment/Local Criminal Record Centre (LCRC) environment?
6. Do you investigate murders/reconstruct murder crime scenes?

SECTION B: THE ROLE OF FORENSIC SCIENCE IN THE INVESTIGATIONS OF CRIME

7. What is the meaning of 'forensic science'?
8. What is the role of the Forensic Science Laboratory (FSL) in criminal investigations?
9. What are the different divisions in the FSL?
10. What is criminal investigation?
11. According to your understanding, what are the objectives of criminal investigations?
12. According to your understanding, what is the purpose of criminal investigations?
13. What is the meaning of a 'crime scene'?
14. What is crime scene investigation?
15. How is forensic science used in the investigation of murder cases?
16. From your understanding, what is the role of the SAPS detective in murder investigations?
17. From your understanding, what is the role of the LCRC personnel in murder investigations?

SECTION C: PHOTOGRAPHY AS PART OF FORENSIC SCIENCE USED IN THE RECONSTRUCTION OF MURDER CRIME SCENES

18. What is the meaning of 'forensic photography'?
19. What is the purpose of forensic photography?
20. What is the evidential value of forensic photography?

21. What are the different types of forensic photography?
22. Explain how photography during the preliminary investigation can be of value in the reconstruction stage.
23. What is a crime scene reconstruction?
24. What is the purpose of a crime scene reconstruction?
25. When do you conduct a crime scene reconstruction?
26. Who requests a crime scene reconstruction to be conducted?
27. Under what circumstances would you request a murder scene reconstruction to be conducted?
28. On average, how many murder crime scenes are requested to be reconstructed per month?
29. Describe the process in which a murder scene is generally reconstructed?
30. Explain how forensic photography is used when conducting murder scene reconstructions?
31. How does photographing the post-mortem assist in the reconstruction stage?
32. What are the standard operating procedures to photograph physical evidence found on a murder scene, whereby the crime scene photographs serve as the primary/only source of information available in the reconstruction process?
33. In your opinion, what improvements can be made to enhance the results of murder scene reconstructions from the way in which they are currently conducted?

THANK YOU FOR YOUR PARTICIPATION

ANNEXURE C

South African Police Service | Suid-Afrikaanse Polisiedienste

Privaatsak Private Bag X94	Pretoria 0001	Faks No. Fax No.	(012) 393 2128

Your reference/U verwysing:
My reference/My verwysing: 3/34/2
Enquiries/Navrae: Lt Col Joubert
Intern Thenga
Tel: (012) 393 3118
Email: JoubertG@saps.gov.za

THE DIVISIONAL COMMISSIONER: RESEARCH
SOUTH AFRICAN POLICE SERVICE
PRETORIA
0001

Mr S Singh
UNIVERSITY OF SOUTH AFRICA

PERMISSION TO CONDUCT RESEARCH IN SAPS: AN EVALUATION OF THE ROLE OF FORENSIC SCIENCE IN CRIME SCENE RECONSTRUCTION: MASTERS DEGREE: UNIVERSITY OF SOUTH AFRICA: RESEARCHER: S SINGH

The above subject matter refers.

You are hereby granted approval for your research study on the above mentioned topic in terms of National Instruction 1 of 2006.

Further arrangements regarding the research study may be made with the following offices:

The Provincial Commissioner: KwaZulu-Natal:

- **Contact Person:** Col Van der Linde
- **Contact Details:** (031) 325 4841

The Divisional Commissioner: Forensic Services:

- **Contact Person:** Col Rababalela
- **Contact Details:** (012) 421 0440

The Divisional Commissioner: Detective Services:

- **Contact Person:** Col Stassen
- **Contact Details:** (012) 393 1902

Kindly adhere to par 6 of our letter signed on the **2017-05-31** with the same above reference number.

LIEUTENANT GENERAL
DIVISIONAL COMMISSIONER: RESEARCH
DR BM ZULU

DATE: 2017/06/14

SUID-AFRIKAANSE POLISIEDIENS SOUTH AFRICAN POLICE SERVICE

Privaatsak/Private Bag X 94

Verwysing/Reference:	3/34/2
Navrae/Enquiries:	Lt Col Joubert Intern Thenga
Telefoon/Telephone:	(012) 393 3118

DIVISION: RESEARCH
SOUTH AFRICAN POLICE SERVICE
PRETORIA
0001

A. The Provincial Commissioner
KWAZULU-NATAL

B. The Divisional Commissioner
FORENSIC SERVICES

C. The Divisional Commissioner
DETECTIVE SERVICE

PERMISSION TO CONDUCT RESEARCH IN SAPS: AN EVALUATION OF THE ROLE OF FORENSIC SCIENCE IN CRIME SCENE RECONSTRUCTION: MASTERS DEGREE: UNIVERSITY OF SOUTH AFRICA: RESEARCHER: S SINGH

A-C 1. The above subject matter refers.

2. The researcher, Mr S Singh, is conducting a study with the aim ***to evaluate the role of Forensic Science in the investigation of crime and how photography can be used as part of Forensic Science in the reconstruction of a crime scene.***

3. The researcher is requesting permission to interview detectives from the 7 Police Stations in the Ethekwini Central Cluster, including Durban Central, Berea, Sydenham, Point, Mayville, Cato Manor and Umbilo and Crime Scene Experts from Durban Local Criminal Record Centre.

4. The proposal was perused according to National Instruction 1 of 2006. This office recommends that permission be granted for the research study, subject to the final approval and further arrangements by the office of the Provincial Commissioner: KwaZulu-Natal and the Divisional Commis-sioners: Forensic Services and Detective Service.

5. We hereby request the final approval by your office if you concur with our recommendation. Your office is also at liberty to set terms and conditions to the researcher to ensure that compliance standards are adhered to during the research process and that research has impact to the organisation.

PERMISSION TO CONDUCT RESEARCH IN SAPS: AN EVALUATION OF THE ROLE OF FORENSIC SCIENCE IN CRIME SCENE RECONSTRUCTION: MASTERS DEGREE: UNIVERSITY OF SOUTH AFRICA: RESEARCHER: S SINGH

6. If approval granted by your office, this office will obtain a signed undertaking from researcher prior to the commencement of the research which will include your terms and conditions if there are any and the following:

6.1. The research will be conducted at his/her exclusive cost.

6.2 The researcher will conduct the research without the disruption of the duties of members of the Service and where it is necessary for the research goals, research procedures or research instruments to disrupt the duties of a member, prior arrangements must be made with the commander of such member.

6.3 The researcher should bear in mind that participation in the interviews must be on a voluntary basis.

6.4 The information will at all times be treated as strictly confidential.

6.5 The researcher will provide an annotated copy of the research work to the Service.

7. If approval granted by your office, for smooth coordination of research process between your office and the researcher, the following information is kindly requested to be forwarded to our office:

- **Contact person:** Rank, Initials and Surname.
- **Contact details:** Office telephone number and email address.

8. A copy of the approval (if granted) and signed undertaking as per paragraph 6 supra to be provided to this office within 21 days after receipt of this letter.

9. Your cooperation will be highly appreciated.

LIEUTENANT GENERAL
DIVISIONAL COMMISSIONER: RESEARCH
DR BM ZULU

DATE: 2017/05/31

ANNEXURE D

UNISA | college of law

COLLEGE OF LAW RESEARCH ETHICS REVIEW COMMITTEE

Date: 2016/09/15

Reference: ST 99
Applicant: S. Singh

Dear S. Singh
(Supervisors: Mr R. J. Mokwena & Dr N.J.C. Olivier)

DECISION: ETHICS APPROVAL

Name	**S. Singh**
Proposal	**An evaluation of forensic science in crime scene reconstruction**
Qualification	**MTech**

Thank you for the application for research ethics clearance by the College of Law Research Ethics Review Committee for the above mentioned research. Final approval is granted.

The application was reviewed in compliance with the Unisa Policy on Research Ethics.

The proposed research may now commence with the proviso that:

1. ***The researcher will ensure that the research project adheres to the values and principles expressed in the Unisa Policy on Research Ethics which can be found at the following website:***

   http://www.unisa.ac.za/cmsys/staff/contents/departments/res_policies/docs/Policy_Research%20Ethics_rev%20app%20Council_22.06.2012.pdf

2. ***Any adverse circumstances arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the College of Law Ethical Review Committee.***

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392, Unisa, 0003, South Africa
www.unisa.ac.za/law

en Rubric

An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants

3. *The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.*

Note:

The reference number (top right corner of this communique) should be clearly indicated on all forms of communication (e.g. Webmail, E-mail messages, letters) with the intended research participants, as well as with the URERC.

Kind regards

PROF B W HAEFELE
CHAIR PERSON: RESEARCH ETHICS REVIEW COMMITTEE
COLLEGE OF LAW

PROF R SONGCA
EXECUTIVE DEAN:
COLLEGE OF LAW

ANNEXURE E

South African Police Service South African Police Service

Private Bag X1500

Your reference:

My reference: 3/3/4

Enquiries: LT COL V NAIDOO
Tel no: 031 3254723

THE HEAD
PROVINCIAL CRIMINAL RECORD AND
CRIME SCENE MANAGEMENT
KWA ZULU NATAL

MR S SINGH
UNIVERSITY OF SOUTH AFRICA

PERMISSION TO USE PHOTOGRAPHS PROVIDED BY DURBAN LCRC IN RESEARCH TOPIC: THE VALUE OF FORENSIC SCIENCE IN CRIME SCENE RECONSTRUCTIONS: MASTERS DEGREE UNIVERSITY OF SOUTH AFRICA

1. The above subject matter refers.

2. The researcher MR Singh is hereby granted permission to utilise photographs reproduced by Durban LCRC.

3. The photographs used in his dissertation must not include that of victims or of a graphic nature.

COLONEL
PROVINCIAL COMMANDER DECENTRALISED LCRC
CRIMINAL RECORD & CRIME SCENE MANAGEMENT
KWA-ZULU NATAL
MB SHEZI 2018/05/23